ENGINEERING
NEWS-RECORD

35th ANNUAL survey OF costs AND trends

The Boom Continues—an economic appraisal

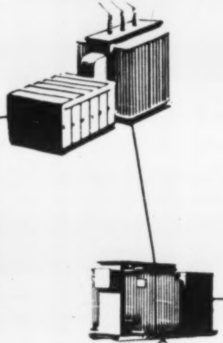
Review and Forecast of Engineering Developments

Progress and Prospects on Major Projects—

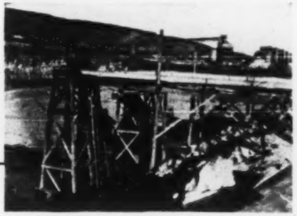
Construction Cost Guide for 1950

pushing the SWIFT COLUMBIA aside ... *Electrically*

McNary Dam Contractors depend on General Electric equipment to make a success of "the toughest river diversion ever undertaken."



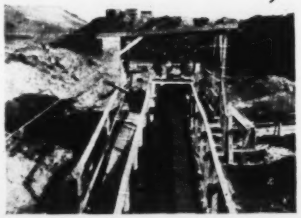
1. This G-E powered shovel handles 5 cubic yards of rock excavation with every bite. Operating from the 2400-volt a-c system, it responds instantly to the operator's touch; is easy to maintain despite rough usage.



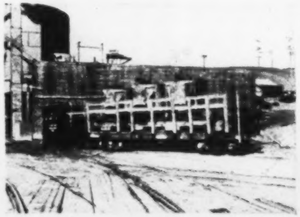
5. Deep-well pumps keep leakage from flooding the construction area. The same large Tri-Clad vertical motors driving these pumps have done yeoman service for the contractors on many previous jobs.

The 1953 deadline for initial generation of power at the McNary Dam project makes it an unprecedented "race against high waters." Making this deadline is a necessary step towards the alleviation of the acute power shortage in the Northwest. Because of this, the whole construction world is carefully watching the work that leads to the beginning of closure sections operations next fall. To meet this tough schedule, contractors working under contracts with the Corps of Engineers are relying on *electric drives* supplied and co-ordinated by General Electric.

Construction equipment, driven by G-E motors and control, and supplied from G-E distribution systems, will help meet your schedules with a maximum of safety, economy, and ease of maintenance. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*



2. Five classes of aggregate are moved from stockpiles to batch plant on belt conveyors like this. G-E motors drive and G-E controls protect these crucial links in the concreting operations at McNary.



3. Four 25-ton G-E industrial locomotives (dinkies) move concrete—three 4-yard buckets at a time—from batch plant along a 675-foot wooden trestle at just the speed demanded by the schedule.

4. Two giant electrified revolving gantries remove buckets from railroad dinkies and place concrete in the world's highest single-lift navigation lock. Both cranes are driven by General Electric hoisting systems.

Ask him Today!

Whether you buy or build construction equipment, your G-E representative can show you how to do a better job—at lower cost—by complete electrification. Write him now, and he'll call on you at your convenience.

Electrified Construction
BETTER PRODUCT
LOWER COST

GENERAL ELECTRIC

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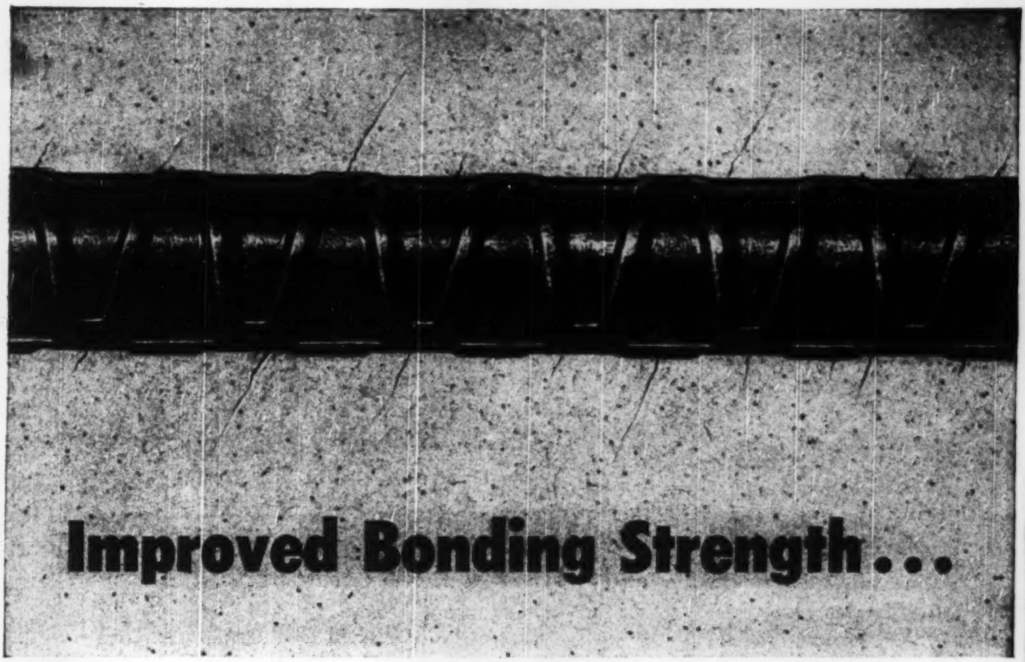

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It's been proved time after time — the higher the bonding efficiency of reinforcing bars, the fewer the cracks in the concrete.

The improved Bethlehem Reinforcing Bar virtually eliminates wide, unsightly cracks in concrete because of its exceptionally high bond strength. Its high, closely spaced ribs provide a continuous firm key between steel and concrete. This ensures low slips at working loads — and the lower the slip of steel in concrete the finer and more closely spaced will be the resulting tensile cracks.

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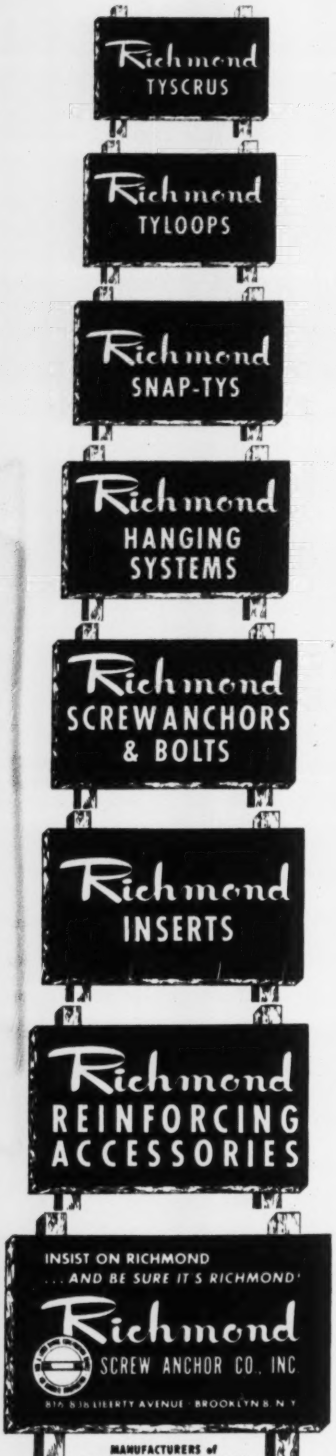
Bethlehem Reinforcing Bars



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ENGINEERING NEWS-RECORD

VOLUME 144 MARCH 23, 1950 NO. 12

WALDO G. BOWMAN
Editor

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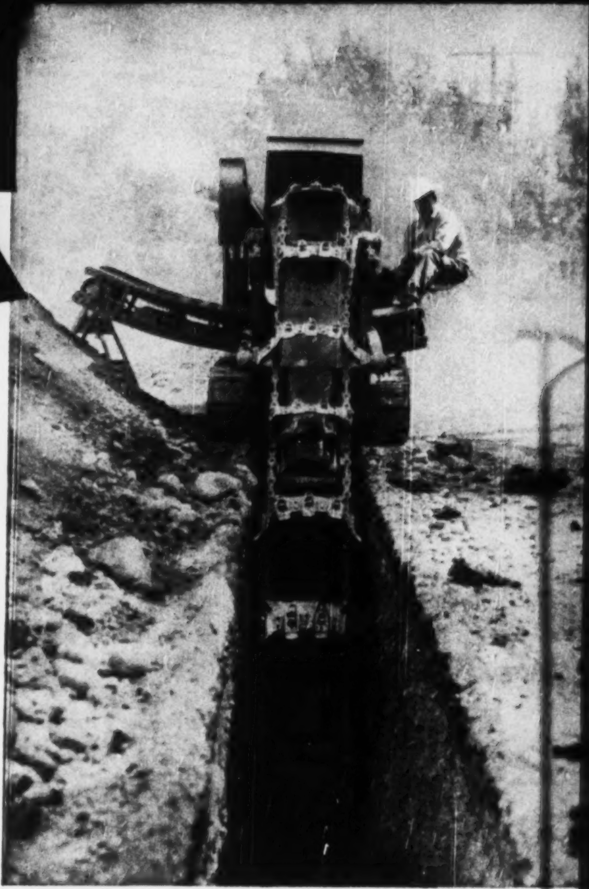

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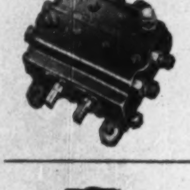
The Model 406 is a prominent member of the family of Buckeye Ditchers described as providing "The Most Ditch for the Least Money." It has a reputation for fast digging, stamina and versatility. The telescoping boom provides digging depths down to 6′ to 8′; cutting widths are from 17″ to 24″. Being exceptionally compact, the 406 works in close quarters as well as in the wide open spaces.

Vickers Hydraulics has an important part in the performance of the 406. The boom hoist is driven by a Vickers Hydraulic Motor which provides positive control at all times . . . boom cannot float or sink in ditch. Raising or lowering of boom is easily accomplished. Another Vickers Hydraulic Motor quickly shifts the conveyor from the extreme position on one side of machine to the other (or any intermediate position). When working under close or irregular conditions, this feature is invaluable in gaining clearance. The Vickers Pump shown also supplies power for the hydraulic brakes.

Vickers Hydraulics improves the operation of a great variety of construction machinery. Get in touch with the nearest office for information and data on Vickers hydraulic equipment designed and built expressly for construction machinery and information on other cost-cutting applications.

Vickers Double Pump consists of two vane type pumps driven from same shaft . . . providing power for two separate hydraulic circuits. Exclusive "hydraulic balance" construction assures longer pump life.



Vickers Sectional Type Multiple-Unit Valve is available in many combinations for convenient and selective control. Includes relief valve for overload protection.

Vickers Gear Type Hydraulic Motor has complete hydraulic balance (both radial and axial) that eliminates pressure loads, thus providing longer life, higher operating efficiency, greater practical operating pressure.

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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

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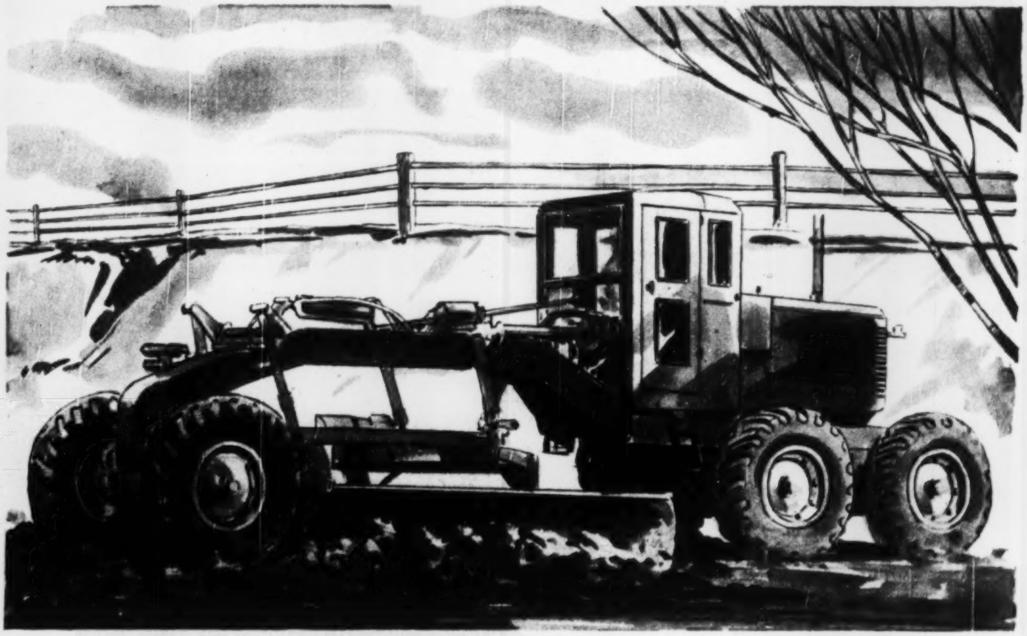

road grader

ONE of the larger and more expensive pieces of road machinery is the grader. Because of the initial investment, and because of the punishment it is subjected to—a good finish is important. A finish that will stand up under violent impacts, abrasion from sand and gravel, stains from road oil and extremes in temperature.

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It is the ability of Northwest equipment to fit itself to the most profitable solution of the problem that makes it standard with so many leading contractors.

The Northwest "Feather-Touch" Clutch Control makes operation on these high loads easy *without* the use of delicate equipment, pumps or valves. Uniform Pressure Swing Clutches eliminate the jerks and grabs that would make swinging booms like this tough. The Northwest High-Speed, Power-Controlled Boom Hoist is independent of all other operations.

These are just a few of the many Northwest advantages that make the "long reach" jobs simpler and more profitable. But, whatever kind of a crane job you have, you owe it to yourself to find out why so many contractors buy Northwests again and again. Let us give you more complete details.

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1 CENT A TON

Low Bidding Depends on Low Cost Crushing

FOR EXAMPLE one contractor crushing river gravel with a 30″ x 9″ Kue-Ken* Crusher has run 18 months on the original jaw plates. They have not been turned once. When reversed should give an additional 14 months service. Jaw plates on previous crusher were completely worn out in three months.

His Kue-Ken Crusher operates in closed circuit with a screen. 100% minus 1½″ and 100% minus 1″, depending on requirements. Capacity of plant 800 tons per 8 hours to 1½″, about 50% thru the crusher. In 18 months operation 90% of total production has been 100% minus 1″. *The previous crusher was unable to produce anything finer than 1½″.*

ANOTHER OPERATOR uses a 30″ x 12″ Kue-Ken Crusher rated at 34 tons per hour of 2″ rock actually gets 80 to 125 tons per hour. The feed is extremely hard river boulders. In the same plant a 24″ x 10″ Kue-Ken produces 75 tons per hour of 3″ rock. The catalog rating is only 54 tons per hour.

Longer Jaw Plate Life and Bonus Capacity gives lowest cost crushing to Kue-Ken users. Write today for Bulletin 605.

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#90 36″ x 20″

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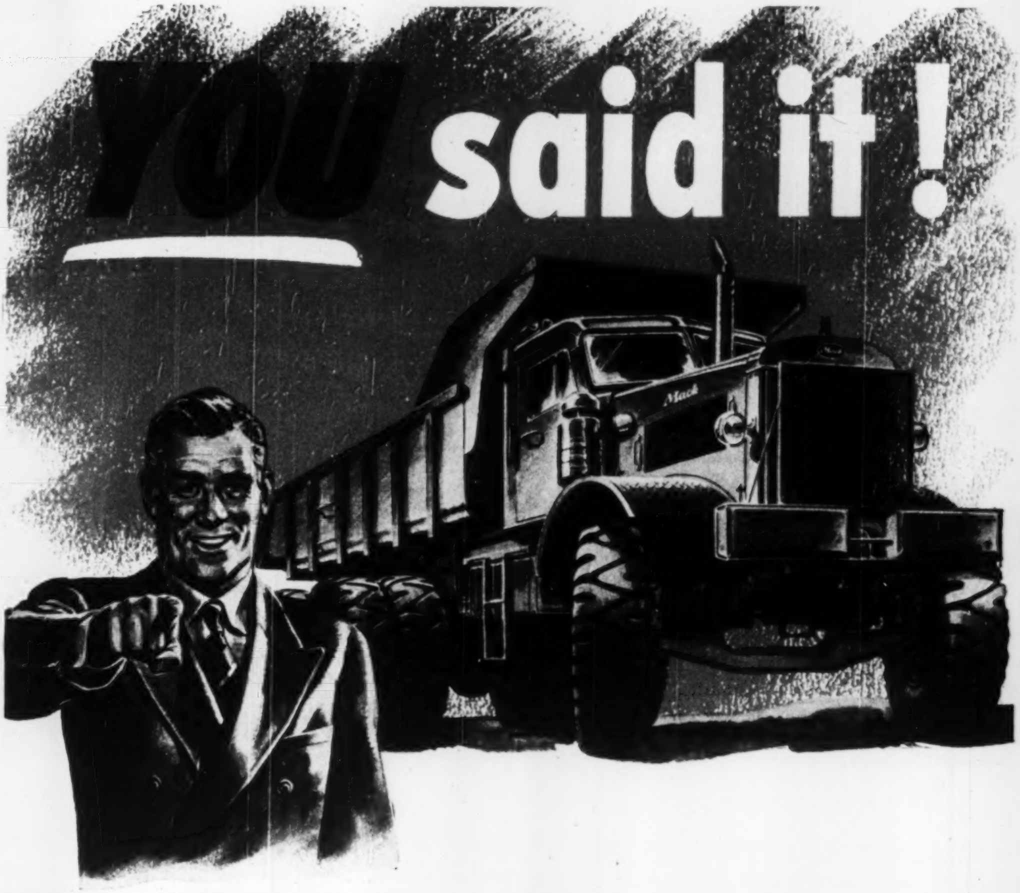

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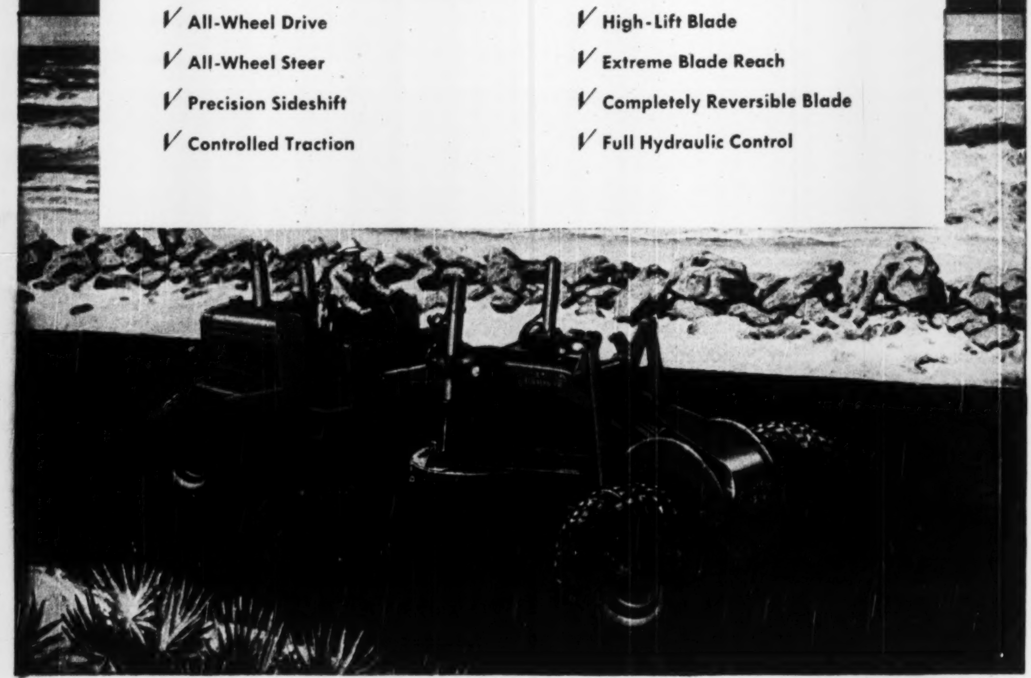

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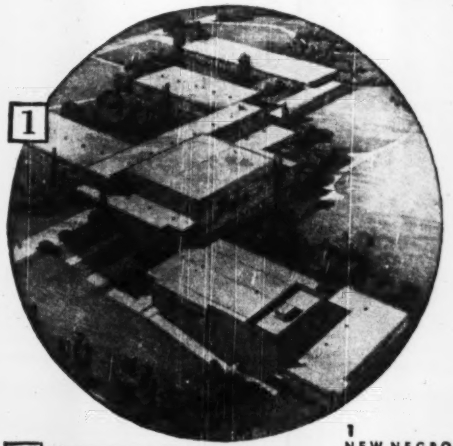
ZONOLITE* Vermiculite Concrete Roofs

FOR INSULATING 5 NEW SCHOOLS

1



Roof decks that combine structural strength with thermal insulating efficiency are being designed by leading architects in all parts of the country. In Shreveport, La., alone, five different architects specify Zonolite Vermiculite Concrete for five different schools. Here's Why!

LOW COST—No additional insulation is needed on a Zonolite roof deck;

PERMANENT—Made by mixing Portland cement and Zonolite Brand Vermiculite Aggregate, a rotproof, verminproof mineral.

LIGHTWEIGHT—Zonolite Aggregate weighs as little as 6 lbs. per cubic foot, compared to 100 lbs. for sand.

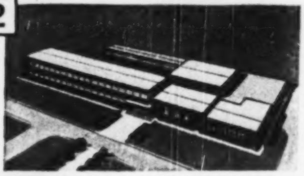
FIREPROOF and FIRESAFE—High degree of thermal insulation blocks passage of heat. Won't burn—fusion point of vermiculite is 2500°F.

and here's how:

Fast, economical applications of Zonolite structural concrete roofs may be made in a variety of ways; Pour it over paper-backed welded wire mesh—here no additional reinforcing is necessary, no troweling or tamping required, just screed to level. Or pour Zonolite insulating concrete over ribbed metal lath, over fiber, asbestos cement, or gypsum board forms; Zonolite concrete may also be pre-cast into slabs, easy to handle because they're so light in weight.

Zonolite concrete structural decks in place weigh about one-fifth as much as ordinary concrete, permitting great economies in the use of structural steel; Sloping for drainage is easily accomplished; cants, crickets and saddles easily formed. Provides the ideal surface for built-up roofing.

2



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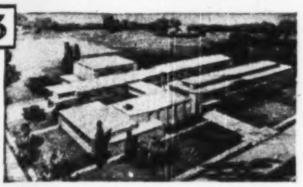

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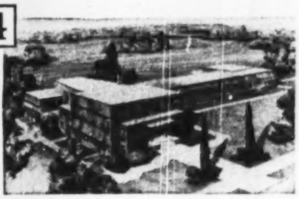

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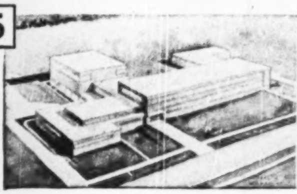


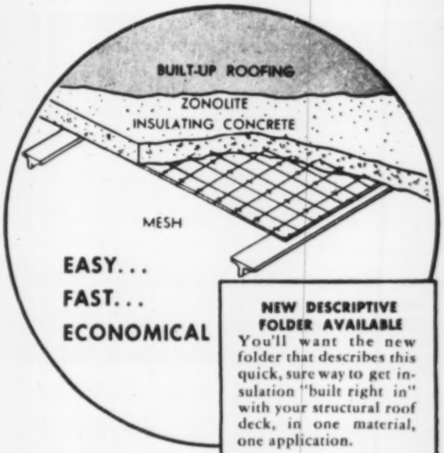
1
NEW NEGRO HIGH SCHOOL Shreveport, La. About 132,000 square feet of floor area. J. A. Harper, Contractor, Crowville, La. Van Os & Flaxman, Architects, Shreveport, La.

2
SPRINGHILL HIGH SCHOOL, Shreveport, La. Peyton & Bosworth, Architects, W. A. Grey Construction Co., Contractor. Project includes about 9,780 square feet of Zonolite roof.

3
CEDAR GROVE JUNIOR HIGH SCHOOL, Shreveport, La. Floor area, 85,000 square feet. Wm. B. Wiener, Architect, Shreveport, La. Nathan Wohlfield, Contractor, Dallas, Texas.

4
JUNIOR HIGH SCHOOL BUILDING, Lakeshore Drive, Shreveport, La. J. Cheshire Peyton, Architect, Harry Bosworth, Associate, Seth E. Giem & Associates, General Contractors, Jackson, Miss. Approximate floor area 90,000 square feet.

5
JUNIOR HIGH SCHOOL BUILDING, for Caddo Parish School Board, Shreveport, La. Walker & Walker and Associates, Shreveport, La. Roof area, 65,000 square feet.



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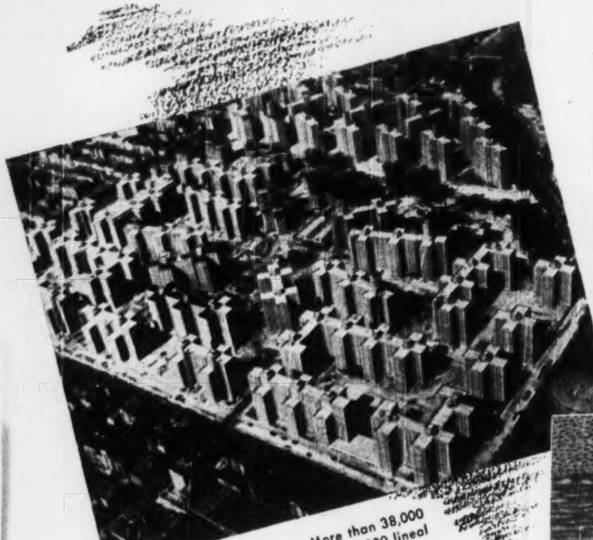
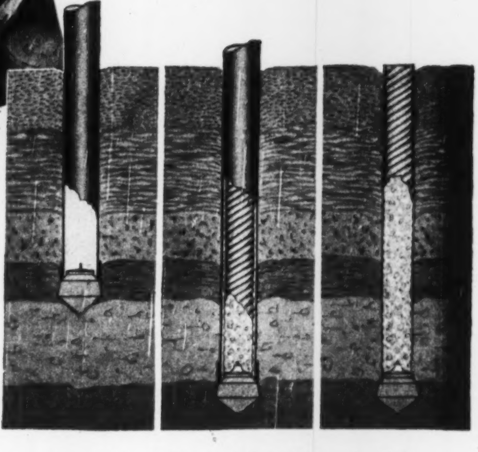


Stuyvesant Town, N.Y.C.—More than 38,000 Button Bottom piles . . . over 1,500,000 lineal ft. . . . support 35 thirteen-story buildings.



Precast Button Bottom followed by steel casing, is driven into bearing stratum.

Corrugated steel shell is then lowered undamaged inside protective driving casing, and locked onto Button Bottom.

Casing is withdrawn allowing compressed soil to expand and grip pile shaft.

THE OVERSIZE PRECAST POINT distributes the load over a greater area in the bearing stratum increasing its density and providing ample carrying capacity from the start. When the soil reforms around the shaft, friction provides *additional* load capacity. In tests at the Stuyvesant Town and Riverton housing projects of the Metropolitan Life Insurance Company, friction increased driving resistance of Button Bottom piles up to 1500%!

DO YOU HAVE A FOUNDATION PROBLEM? Although WESTERN usually employs one or more of its exclusive types of foundations, brand new variants will be created where necessary, to solve your job. Catalog A with illustrations and descriptions of WESTERN piles sent upon request.

see our CATALOG in SWEET'S FILE

*Patented

FOUNDATIONS FOR

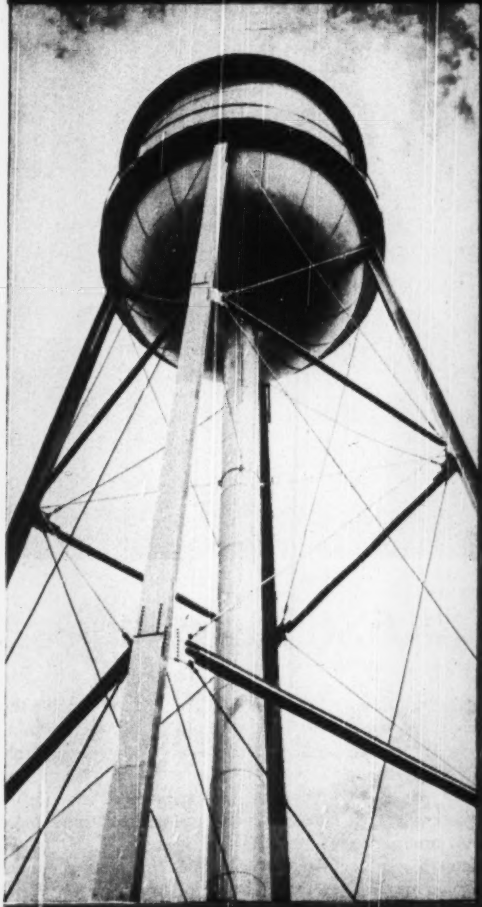
**INDUSTRIAL PLANTS • POWER PLANTS • BRIDGES
PIERS AND DOCKS • AIRPORTS • STEEL PLANTS
HOUSING PROJECTS • COMMERCIAL BUILDINGS
SCHOOLS • Etc.**

**BUTTON BOTTOM PILES • COMPOSITE PILES • PEDESTAL PILES • CAISSON PILES
PROJECTILE PILES • COMPRESSED CONCRETE PILES • DRILLED-IN CAISSONS
PRE-DESIGN AND PRE-CONSTRUCTION LOAD TESTS • SOIL BORINGS
CORROSION PROTECTION FOR H-BEAM PILES**

W

WESTERN FOUNDATION CORPORATION
308 W. Washington St., Chicago 6, Ill. • 2 Park Avenue, New York 16, N. Y.

PERFORMANCE *Often* Guaranteed . . .
PRICE *Never* Padded . . .
On Steel Plate Construction



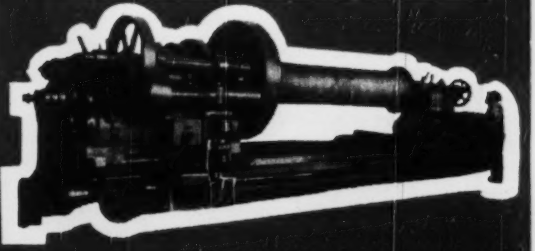
Many Posey installations are actually made with a guarantee that equipment performance will measure up to fixed requirements. Yet often these same installations are fabricated at price *savings* for users.

To eliminate needless costs, Posey's engineers draw upon "case history" files dating back to 1910. Production is supervised by top-flight executives with the authority to cut through red tape . . . by-pass routine. Above all — Posey has the *plant capacity* needed for smooth scheduling of production . . . the modern equipment required by today's construction demands.

A recently published 12-page bulletin tells in picture form, the story of Posey Iron Works' facilities and products. A study of it may show you ways to lower your steel plate construction costs. Write today for your free copy — without obligation.

Posey's 16 ft. Lathe

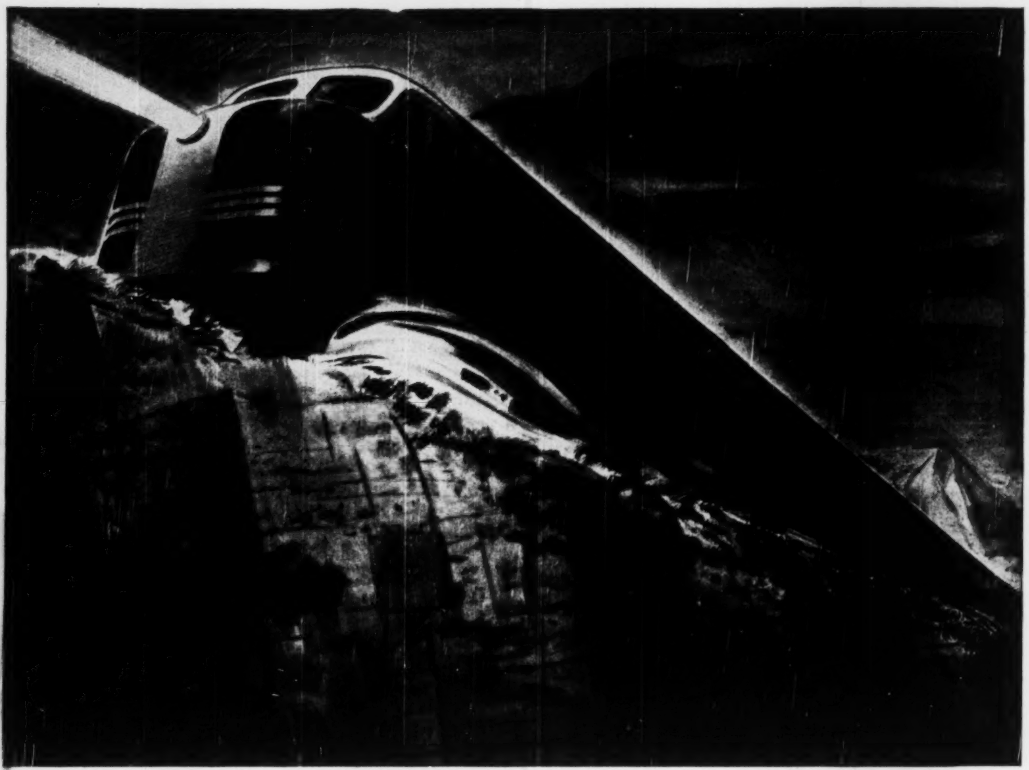
16' length x 94" diameter lathe gives Posey Iron Works an edge on big jobs requiring lathework. This equipment stands in the South Plant's special erection shop.



NEW YORK OFFICE: Graybar Bldg.

GENERAL STEEL PLATE CONSTRUCTION
ELEVATED TANKS · GAS HOLDERS · PIPE · PRESSURE VESSELS
Established Since 1910
DIVISIONS: Brick Machinery · Foundry · Industrial Heating · Iroquois · Shipbuilding · Steel Plate

POSEY IRON WORKS, INC.
(Steel Plate Division)
formerly LANCASTER IRON WORKS, INC.
LANCASTER, PA.



This "Iron Horse" Has 38,636 Fasteners

It takes 38,636 tough, accurate fasteners of high tensile strength — to match the stress and strain on the framing members of a diesel pulling heavy freight loads.

More than 2,300 bolts . . . 13,800 nuts . . . 21,700 screws . . . 800 rivets furnish the forces that hold modern 4 unit diesel assemblies together.

Because these fasteners have such a vital responsibility, top quality is essential. That's why Russell, Burdsall & Ward for over a century has carried on continuous and intensive research and development work, and has invested consistently in large expansion and improvement programs.

With the price of fasteners such a small part of the total production cost, you'll find it doesn't pay to take chances with fastener quality. For it isn't the initial price but the cost of *using* fasteners that counts.

To attain True Fastener Economy —save assembly time, eliminate or reduce plant inspection, and get the maximum holding power per dollar of fastener cost with a dependable quality fastener. True Fastener Economy contributes to the kind of production savings that puts more and more diesels on U. S. tracks every year. It is this type of contribution to major American industries that explains why — for over 104 years — RB&W has been *making strong the things that make America strong.*

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

RB&W

Plants at: Port Chester, N.Y., Coraopolis, Pa., Rock Falls, Ill., Los Angeles, Calif. Additional sales offices at: Philadelphia, Detroit, Chicago, Chattanooga, Oakland, Portland, Seattle. Distributors from coast to coast.

38,636 Fasteners are used in 1 American diesel locomotive

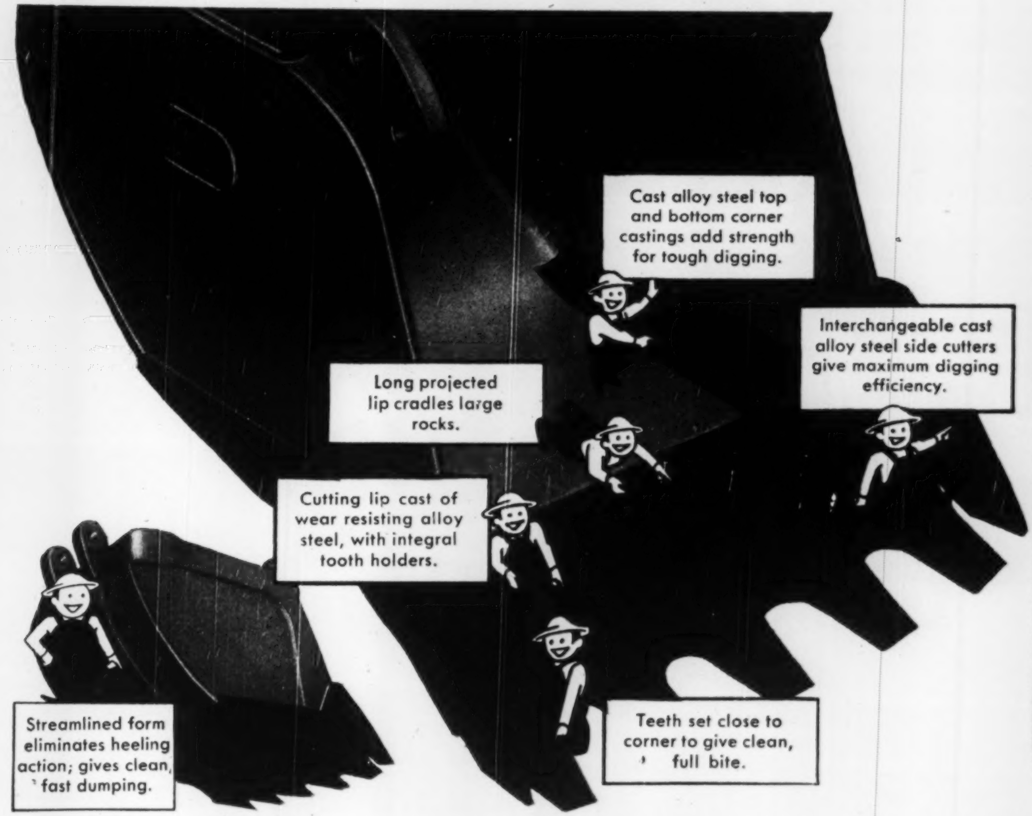
104 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG!

Designed for FAST DIGGING... *Built for* HARD WORK

Thoroughly tested on the proving ground and on the job, the pull shovel dipper shown here is the newest addition to the *ESCO* line of earth moving equipment.

Design is the result of thorough research, and engineering experience gained through making punishment-taking dragline and dipper buckets over a period of many years. Alloy steels used throughout the dipper are specified for maximum resistance to wear and shock.

Sizes range from ⅜ to 2½ yards. For additional information on the *ESCO* pull shovel dipper, see your nearest *ESCO* representative, or fill in and mail the coupon.



Cast alloy steel top and bottom corner castings add strength for tough digging.

Interchangeable cast alloy steel side cutters give maximum digging efficiency.

Long projected lip cradles large rocks.

Cutting lip cast of wear resisting alloy steel, with integral tooth holders.

Streamlined form eliminates heeling action; gives clean, fast dumping.

Teeth set close to corner to give clean, full bite.

ESCO DIPPER AND DRAGLINE BUCKETS

ELECTRIC STEEL FOUNDRY
2167 N. W. 25th Avenue, Portland 10, OREGON

SALES OFFICES AND WAREHOUSES:
CHICAGO, ILL.
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IN CANADA — ESCO LIMITED, VANCOUVER, B.C.

ELECTRIC STEEL FOUNDRY
2167 N.W. 25th Avenue, Portland 10, Oregon
Please send me your bulletin on the new ESCO Hoe Dippers.

Name________________

Address________________

City________________

Zone________ State________

Make and Model of Machine________________

CUMMINS
DIESEL

SINCE 1918...PIONEER OF PROFITABLE POWER
THROUGH HIGH SPEED DIESELS

Here's what you get with

Cummins Diesels

Here are four more honest-to-goodness examples of how owners have saved money—and made money—with Cummins Diesel Engines:

Service One of the more than 200 Cummins Dealers is as close as your phone.

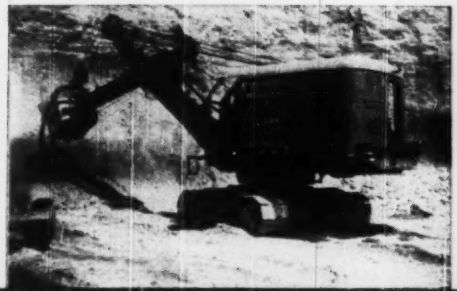
Highspeed Diesel Engines (50-550 hp) for:

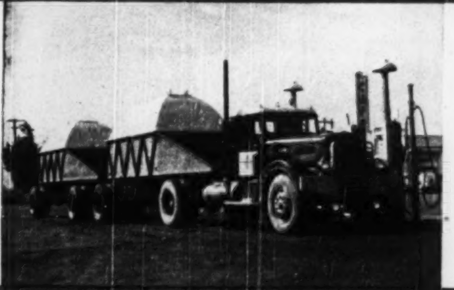
On-highway trucks • off-highway trucks • buses • tractors • earth-movers • shovels • cranes • industrial locomotives • air compressors • logging yarders and loaders • drilling rigs • centrifugal pumps • generator sets and power units • work boats and pleasure craft.

CUMMINS ENGINE COMPANY

LESS FUEL

A Model 710 Osgood shovel equipped with a 1¼-yard bucket and powered with a 150 hp *Cummins Diesel* uses approximately *14 gallons of Diesel fuel* in eight hours. A comparable unit powered with a *gasoline engine* working on the same job uses *45 to 50 gallons* of fuel a shift. This fuel economy report comes from Clarke Certified Concrete Company, Inc., Baltimore, Md.





LESS MAINTENANCE

Permanente Cement Company, Permanente, Calif., standardizes on Cummins Diesels because of their performance and economy. This leader in the cement industry uses 18 Cummins Diesels to power Peterbilt and Sterling tractors pulling flat bed trailers on line-haul work . . . also operates two Cummins-Powered Diesel-electric locomotives. L. M. Minich, Equipment Superintendent, says: "We're sticking to Cummins Diesels and Cummins parts and getting trouble-free transportation."

LONGER LIFE

For 15 years a 150 hp Cummins Diesel powering a six-inch Durant pump on a dredge worked eight hours a day . . . *with only two overhauls.* G. L. Anderson, owner of Anderson Gravel Company, Amite, La., says: "I wouldn't have any other power. That 15-year-old Cummins Diesel gives me such good service that when I started using a second dredge, *I bought another one just like it.*"

MORE WORK

Production of crushed stone and agricultural lime averages *1,200 to 1,500 tons an eight-hour day* in the Mulzer Brothers' quarry near Eckerty, Ind. For reasons of economy and increased production, Mulzer Brothers *standardize on Cummins Power.* A supercharged HRIS-600 Cummins Diesel powers a No. 2540 Austin-Western crusher and feeder; two LP-600 engines each power a No. 28 Gilson pulverizer; and a fourth Cummins Diesel powers a Type No. 604 Lima shovel.

These typical examples of the profit-making power furnished by Cummins *Dependable* Diesels explain why men who pay the most attention to cost sheets and profit and loss statements choose Cummins Power. Write for further proof that Cummins Diesels can save and make *more* money for you.

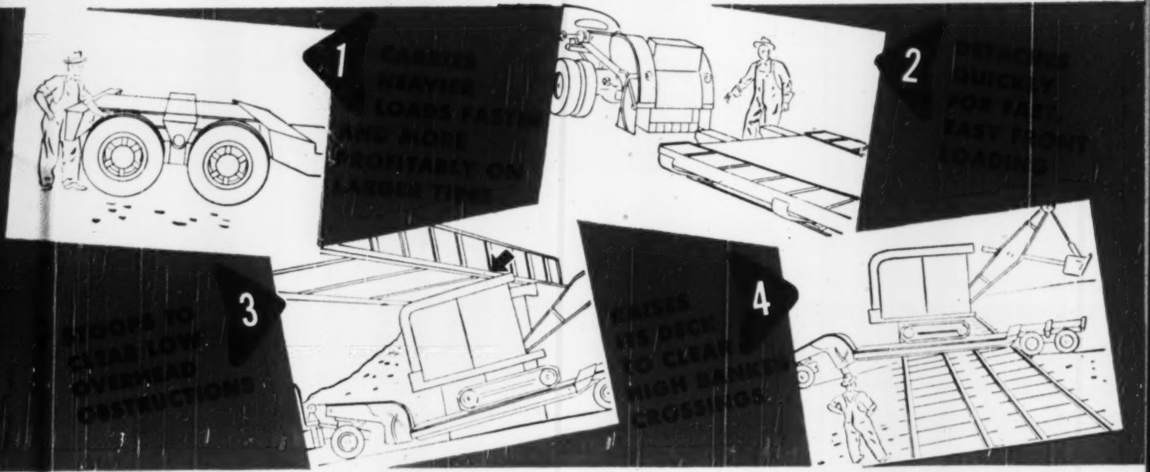
Cost Conscious? **CHOOSE CUMMINS DIESELS**

INC. • COLUMBUS, INDIANA

EXPORT: CUMMINS DIESEL EXPORT CORPORATION • COLUMBUS, INDIANA, U.S.A. • CABLE: CUMDIEX

This 4 FEATURE VERSATILITY
AVAILABLE ONLY IN THE
ROGERS
POWER-LIFT DETACHABLE GOOSENECK

PATENTS PENDING



1 CARRIES HEAVIER LOADS FASTER AND MORE PROFITABLY ON LARGER TIRES

2 DETACHES QUICKLY FOR FAST, EASY FRONT LOADING

3 STOOPS TO CLEAR LOW OVERHEAD OBSTRUCTIONS

4 RAISES ITS DECK TO CLEAR HIGH BANKED CROSSINGS

ROGERS
DETACHABLE GOOSENECK

and

VERSATILITY MEANS

Greater Hauling Profit
Thru more load
at less expense

ROGERS
POWER-LIFT DETACHABLE GOOSENECK

Yes, and it embodies the kind of versatility that makes every haul *easier, faster, more profitable.*

Loading, at a *lower* angle, is *faster. Larger* tires carry heavier loads legally.

Unloading, reloading, detouring are *avoided* through quick adjustment of the deck height to *different conditions* encountered. This is accomplished quickly by means of a cable operated ram.

It's equally as rugged as the standard Rogers Gooseneck regardless of its detachable feature. And it's available on most Rogers Trailers and adaptable to many trailers of other makes.

Bring your equipment up-to-date and be in a position to handle operations more efficiently and more profitably.

Export Office: 50 Church St., N. Y. 7, N. Y.—Cable Address: "Broscites"

ROGERS TRAILERS

ROGERS BROTHERS
CORPORATION
135 Orchard St.
ALBION,
PA.

EXPERIENCE *builds 'em* PERFORMANCE *sells 'em*

Since 1915

From foundry to field house, you build *faster,* and at *lower cost* with

CEMESTO

REG. U. S. PAT. OFF.

WORLD'S MOST VERSATILE BUILDING MATERIAL

Wherever and whatever you build . . . chances are you can build it faster, easier, more economically . . . with CEMESTO* Insulating Structural Panels!

The unique properties of this amazingly versatile material make possible important economies in the design, erection and maintenance of *permanent, fire-resistant, insulated* roof decks, curtain walls and partitions. No wonder that more and more engineers and contractors from coast to coast are specifying Cemesto for industrial, commercial and institutional buildings of all types from foundries to field houses!

Cemesto is a strong, rigid panel made of Celotex cane fibre insulation to which cement-asbestos facing is bonded on both sides by a moistureproof adhesive.

It combines remarkable structural strength with high insulating efficiency that makes any building cooler in summer, warmer and far thriftier to heat in winter. Cemesto can be worked with ordinary hand or power tools. The big panels are easily and quickly applied to either steel or wood framing.

Cemesto resists fire, weather and wear—*lasts the life of the building!* Its smooth, hard, stone-grey surface provides both interior and exterior finish. Unless required for decorative purposes, Cemesto never needs painting or maintenance. And its Celotex cane fibre core is protected against fungus, dry rot and termites by the exclusive patented Ferox® Process.

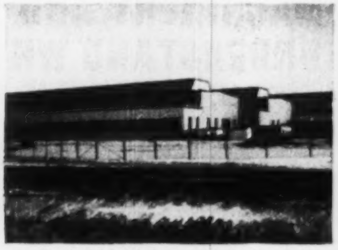
Over 19 years of outstandingly successful use in all types of construction . . . in all climates . . . all over the world prove the stability and permanence of Cemesto. Discover how this modern marvel of building materials can speed work and cut erection costs for you. Mail coupon for complete technical data, including design and application recommendations. No obligation.

THE CELOTEX CORPORATION, CHICAGO 3, ILLINOIS

**Cemesto is a registered trademark identifying a product made only by The Celotex Corporation.*

Cemesto at work in agriculture, in this practical building of The Ohio Mushroom Farm, Lima, Ohio. Contractor: F. H. Clausing, Lima.

Cemesto used in the massive University of Minnesota Winter Sports Arena. Architect: C. H. Johnson & Assoc., St. Paul. Contractor: Sauers Const. Co., St. Paul.



Foundry building of Cemesto at the Bucyrus-Erie Co., Milwaukee, Wisconsin. Architect: Worden-Allen Co. Contractor: Permanent Const. Co.

Attractive and economical use of Cemesto in the Alexander Hamilton Nursery School, one of eighty such units erected in Los Angeles, California.

U. S. Navy residence building of Cemesto and brick masonry built in 1939 at Brooklyn, N. Y. Contractor: White Construction Co., New York, N. Y.

The Celotex Corporation
Chicago 3, Illinois

Please send me, without obligation, complete technical data on Cemesto, including design and application recommendations.

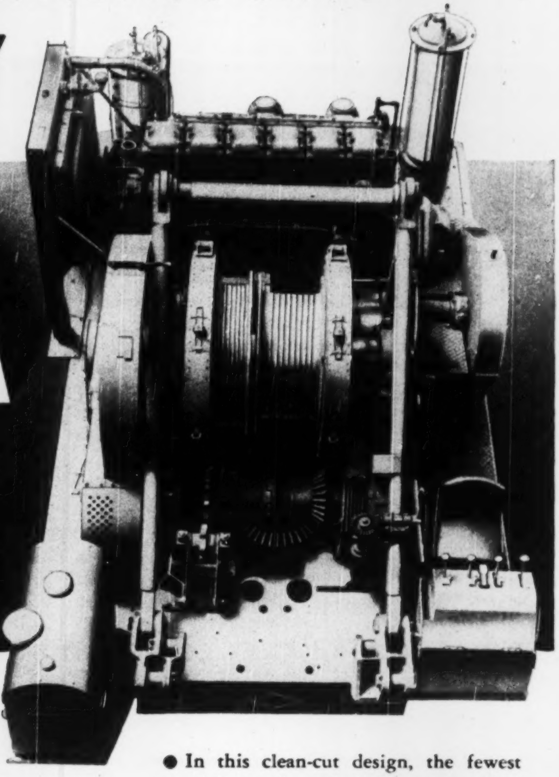
Name ____________________

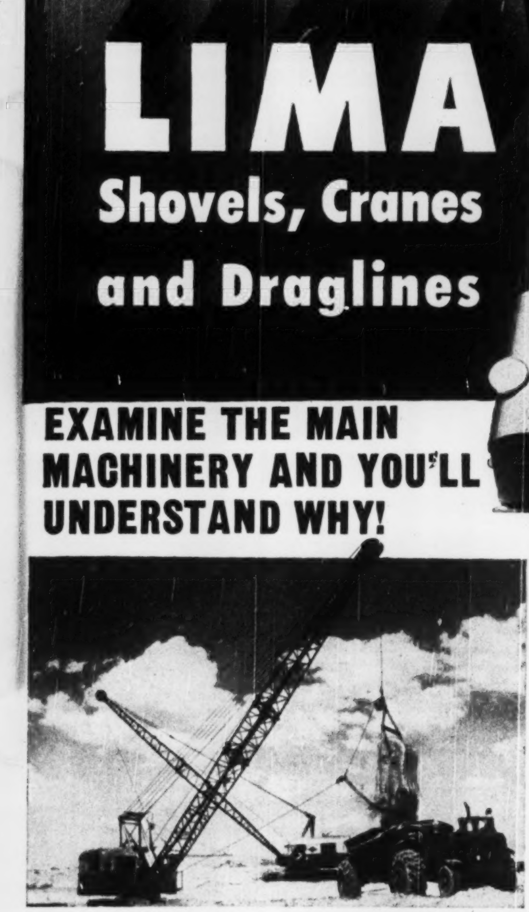
Address ____________________

City ____________ Zone ____ State ____________

Built-in STAMINA *cuts* "DOWN-TIME" of LIMA Shovels, Cranes and Draglines

EXAMINE THE MAIN MACHINERY AND YOU'LL UNDERSTAND WHY!





● In this clean-cut design, the fewest possible number of shafts are required to transmit power from engine to dipper. Important bearings, including those in the drum, are anti-friction type. Large drums increase output and minimize cable wear. Permanently aligned shafts prevent chattering and grabbing of clutches. Extra-rugged construction of machinery base, truck and front end equipment provides ample strength to withstand heavy loads. These are only a few of the reasons why LIMA machines are making records of outstanding performance with *minimum down-time.*

The LIMA line includes Shovels ¾ to 6 yards, Cranes to 110 tons, and Draglines Variable. Rubber-Mounted units are available with ¾ and 1 yard shovels and 35 ton cranes. Offices in principal cities of the world.

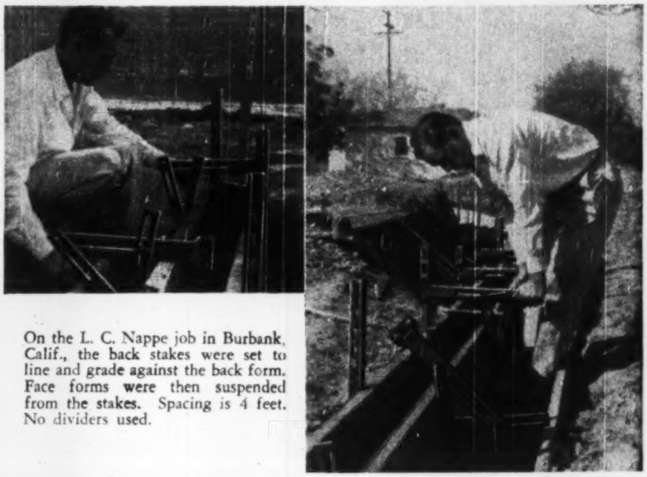
Lima Shovel and Crane Division

LIMA, OHIO

OTHER DIVISIONS: *Lima Locomotive Works Division; Niles Tool Works Co.; Hooven, Owens, Rentschler Co.*

LIMA HAMILTON CORPORATION

NEW! ADJUSTABLE STEEL CLAMPS FOR ALL CURB CONSTRUCTION . . .



On the L. C. Nappe job in Burbank, Calif., the back stakes were set to line and grade against the back form. Face forms were then suspended from the stakes. Spacing is 4 feet. No dividers used.

SAVE WITH LOW COST WOOD FORM CLAMPS *and do a better job*

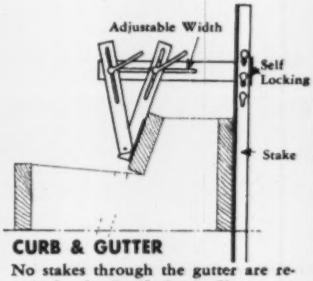
EVERY STANDARD CURB FORM can be set quickly and easily with the Pacific-Boult Form Clamp System—see the standard applications at the right. The clamps are adjustable for curb widths from 4″ to 8″ . . . for batter from vertical to any angle . . . and in height up to 24″. No stakes through the gutter are needed for either integral curb construction or curb and gutter construction when frequent dividing plates are not required.

Set curb forms faster and save labor with these simple self-locking adjustable clamps. The new Pacific-Boult Clamps are simple in construction . . . have no loose pieces or extras. They stay true to line, grade and shape; are easy to set . . . easy to adjust . . . easy to remove. No wrenches or tools are required to set or dismantle the Pacific-Boult Clamps. They save lumber because only a minimum amount of nailing is required.

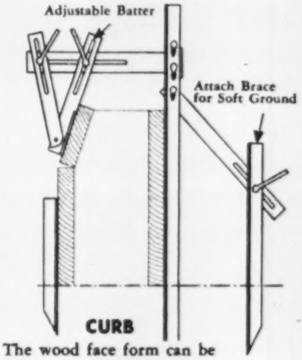
To save money on curb form costs, write for complete description and prices.

PACIFIC ENGINEERING SALES CO.
CHESTER WILLIAMS BUILDING
215 W. Fifth St., Los Angeles 13, Calif.
Dealer inquiries are invited

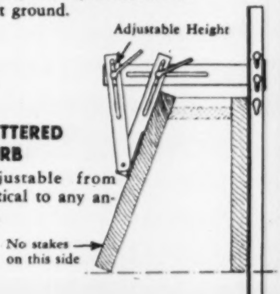
USING WOOD FORMS



CURB & GUTTER
No stakes through the gutter are required – the Pacific-Boult Clamp can be used with or without division plates or wood spacers.



CURB
The wood face form can be removed without disturbing the form-supported system. Brace, shown, is for use in soft ground.

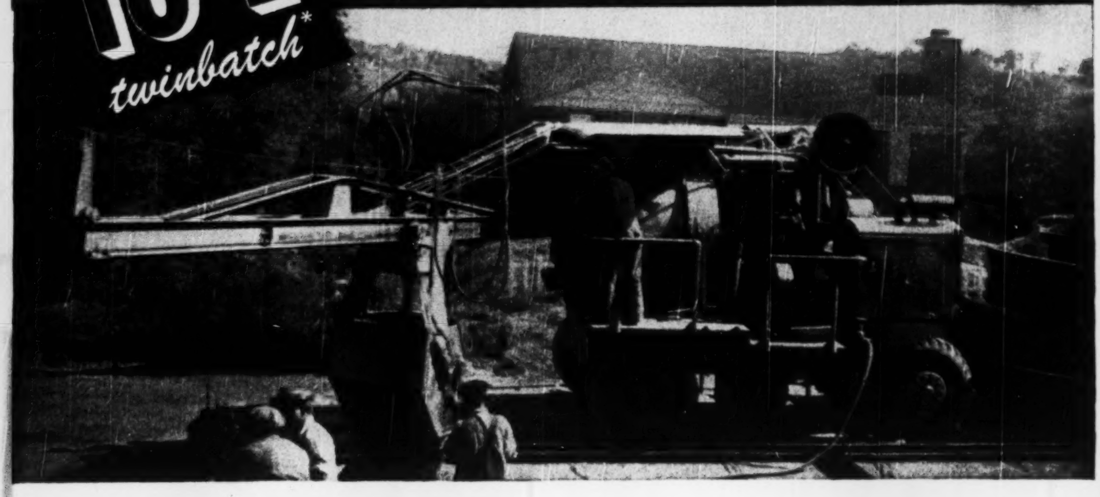


BATTERED CURB
Adjustable from vertical to any angle.

Pacific-Boult **FORM CLAMP SYSTEM**

KOEHRING 16-E *twinbatch**

MOBILE • VERSATILE •

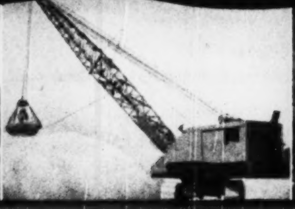


KOEHRING 16-E *twinbatch* provides many special operating advantages for intermediate paving and all types of concrete construction work: 60° elevating boom raises controlled-discharge bucket to a dumping height of 21 feet . . . gives complete flexibility of application for elevated pouring. 16-E *twinbatch* mixes and distributes up to 50 cu. yds. per hour, exceeding the capacity of the larger 27-E single-drum paver. Big, 92-inch wide skip raises in only 7 seconds . . . split-second Autocycle mixing is controlled by Koehring Batchmeter, saves time on every phase of the operating cycle. As a result, the 16-E can hit a top output of 86.7 batches an hour, on 60-second mixing cycle specification. Vertical, syphon-type water tank assures consistent, maximum strength concrete . . . guarantees accuracy to meet all specifications.

In addition, the 16-E *twinbatch* rides on 6 big 11:00 x 20 pneumatic tires . . . works, travels over pavement without surface damage. Drives job to job at speeds to 6 m.p.h. . . . cuts nonproductive moving time, increases work time.

SAVE TIME, MONEY with COMPLETE KOEHRING HEAVY-DUTY LINE

34-E *Dualdrum* PAVER . . . for big production on highways, airports and other extensive paving contracts. Ask, too, about Koehring Longitudinal Finisher for "Ready", precision finishing.



CLAMSHELL CRANE . . . draglines, shovels and hoes . . . available in 4 heavy-duty sizes: ¾-yd., 1-yd., 1½-yd., and the big 2½-yd.

HIGH-SPEED DUMPTOR* . . . with 6-yd. rock body, has 3 speeds forward and reverse for no-turn shuttle haul . . . 1-second gravity dump.
*Trademark Reg. U. S. Pat. Off.

controlled ELEVATED DISCHARGE

FOR STREETS AND HIGHWAY WIDENING

Rubber-tired mobility of 16-E *twinbatch* permits working over streets and new pavement strips without planking. Saves time on the job, and job-to-job. Has overall width of only 8 feet, plus speeds to 6 m.p.h., for fast, self-powered moves.

BRIDGES . . . .

You're not grounded with the 16-E . . . reaches up and out to discharge mixed concrete into forms, hoppers, chutes. Double-channel structural boom is 25 feet long . . . swings in a 160° arc . . . elevates 60° . . . holds firmly in any position . . . discharges controlled bucket at any height up to 21 feet.

CULVERTS . . .

For pouring culverts, and in other similar restricted areas, controlled door on bucket allows gradual discharge, prevents spillage. Clamshell-type bucket door can be opened or closed at any time, operates by hydraulic control. All operating mechanism is outside bucket, prevents clogging. Adjustable strap hangers and perfect oscillation assure vertical dumping position of bucket.

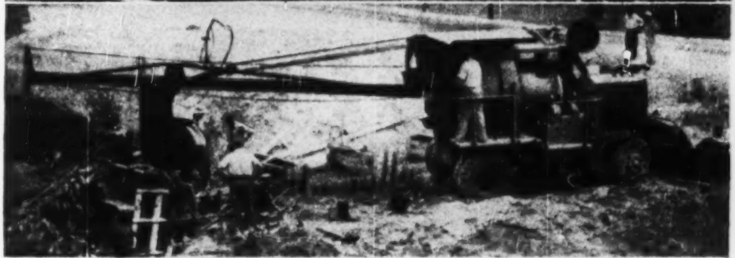
FOUNDATIONS . . .

On footings, pilings, retaining walls, etc., the 16-E *twinbatch* spots its load fast. Big bucket travels 92 feet per minute on elevated boom, 183 feet per minute on horizontal boom. 24 cu. ft. water level capacity of clamshell type bucket is more than ample for full 16 cu. ft. batch . . . plus 10% overload.

BATCHING CONCRETE

The high-production 16-E also can be set up as a central mix plant. Elevated pouring makes it handy for loading trucks, and for handling a variety of miscellaneous batching applications.

It will pay you to check all the other many advantages of this rubber-tired 16-E *twinbatch*. Write for new catalog . . . or call your local Koehring distributor for complete facts.



KOEHRING

COMPANY

MILWAUKEE 10, WIS.

Subsidiaries: KWIK-MIX • PARSONS • JOHNSON

Mail to: KOEHRING COMPANY, Dept. RS, Milwaukee 10, Wisconsin

Please send us new 8-page catalog on the rubber-tired 16-E Twinbatch.

NAME ______________________________

COMPANY ______________________ TITLE ______________

STREET ______________________________

CITY ______________________________

STATE ______________

CUT your hourly cost . . . UP your hourly production

with Firestone TIRES

GROUND GRIP

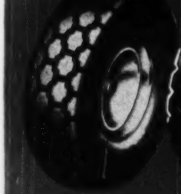
ROLLING equipment represents a profitable investment, but idle equipment means dead loss. When a unit stops, production stops—but costs go right on. We say—and we'll welcome a chance to prove it—that we can shorten your downtime and boost your production with Firestone Tires.

- **WE CAN DO IT** because we carry a complete line to furnish you the right tire for your type of work.
- **WE CAN DO IT** because there's extra material, extra quality, extra skill put into every tire we make.
- **WE CAN DO IT** because our service organization is prepared to see that you get out of Firestone Tires everything we build into them.

Can we do it? . . . Just let us show you! See your Firestone Dealer or Store for complete information.

Listen to the Voice of Firestone every Monday evening over NBC

Copyright, 1950, The Firestone Tire & Rubber Co.



EARTH MOVER

ROCK GRIP

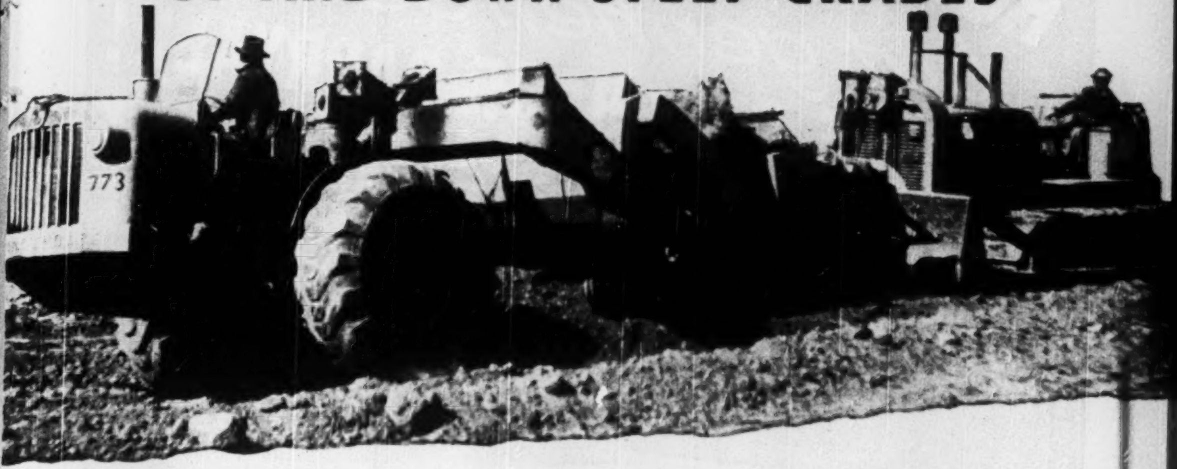
ALL TRACTION

When you buy new tires or new equipment *always specify* **Firestone**

OFF-THE-HIGHWAY TIRES

4 LaPLANT-CHOATE MOTOR SCRAPERS MOVE 5000 YARDS A DAY

UP AND DOWN STEEP GRADES



• 4 Motor Scrapers working for Frank J. Hickey on the 610,000 yard job at the University of California at L.A., are moving dirt at a profit-making pace, up and down steep grades. Each of the four LPC units is moving 1250 yards of 2600-lb. clay every 10 hour shift, on a 2800-ft. cycle, easily negotiating the steep grades occasioned by 30-ft. cuts and 60-ft. fills.

Profit-Producing Features

225 H.P. Buda Diesel

45 H.P. Continental Starting Engine

12 Cu. Ft. Westinghouse Compressor

32 Amp. Autolite Generator

Lipe Rollway Clutch — 17"

Fuller Transmission — 4 A 112

4-Wheel Timken-Detroit Air Brakes

Double-Acting Hydraulic Steering

Big 24:00 x 29 Traction Type Tires

Big Capacity — 14 yds. struck — 17.5 yds. heaped

Big speeds — up to 21.2 mph

Positive Forced Ejection plus High Apron Lift

On the level, LPC Motor Scrapers can't be beat! And up and down grades or in tough conditions, they're more unbeatable than ever for moving the *extra* yardage that gets the job done faster at lower cost per yard. Frank Hickey and other big time contractors lay the blue chips on Motor Scraper performance every time. For day-in, day-out dependability and production, LPC Motor Scrapers are first choice on more and more jobs each day. Get all the facts from your LPC distributor, LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa —West Coast Branch, 1022 77th Ave., Oakland, California

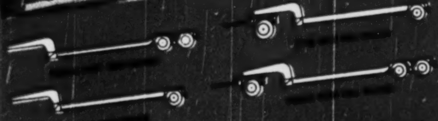
FAMOUS LaPLANT-CHOATE DOZERS — both angling and straight blade — are again available in either hydraulic or cable-operated types. See your LPC distributor NOW!

LaPLANT CHOATE

ROUGH AND READY
but gentle, too!
IT'S THE FRUEHAUF CARRYALL!

FRUEHAUF CARRYALL
Model C40 L

A COMPLETE LINE... ...PLUS SPECIALS!



There are seventeen standard Fruehauf Carryalls ranging in capacity from 10 to 74 tons. In addition, Fruehauf builds "specials" adapted to meet particular requirements. (Carryalls have been built by Fruehauf in capacities to 110 tons.)

YOUR loads, whatever they may be, are on the best equipment for safe, gentle hauling, when they're on a Fruehauf Carryall.

Here are some of the features that make the Fruehauf Carryall the outstanding heavy equipment Trailer on the market. Deep structural outside rails, triple bead welds for extra strength — thick hardwood floors for increased load stability —exclusive Fruehauf-design gooseneck that's extra tough. There are many more. But, the real proof is in its performance. You'll find the Fruehauf Carryall is the best heavy equipment Trailer in the world!

FRUEHAUF TRAILER COMPANY
DETROIT 32 • LOS ANGELES 58
In Canada: Weston, Ont.

FRUEHAUF *Trailers*
"ENGINEERED TRANSPORTATION"

WORLD'S LARGEST BUILDERS OF TRUCK-TRAILERS

WeldELLS®

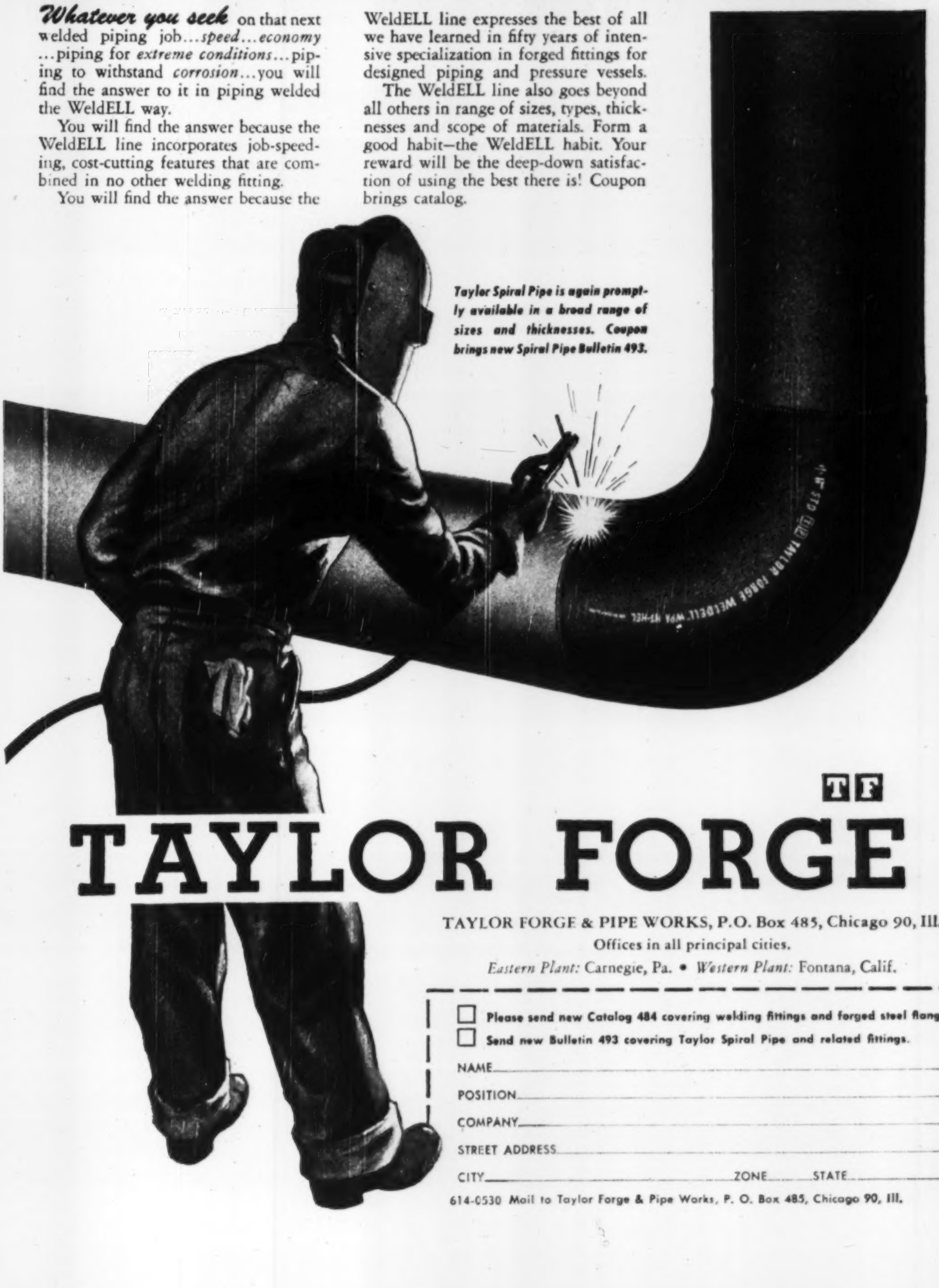
Whatever you seek on that next welded piping job...*speed*...*economy*...piping for *extreme conditions*...piping to withstand *corrosion*...you will find the answer to it in piping welded the WeldELL way.

You will find the answer because the WeldELL line incorporates job-speeding, cost-cutting features that are combined in no other welding fitting.

You will find the answer because the WeldELL line expresses the best of all we have learned in fifty years of intensive specialization in forged fittings for designed piping and pressure vessels.

The WeldELL line also goes beyond all others in range of sizes, types, thicknesses and scope of materials. Form a good habit—the WeldELL habit. Your reward will be the deep-down satisfaction of using the best there is! Coupon brings catalog.

Taylor Spiral Pipe is again promptly available in a broad range of sizes and thicknesses. Coupon brings new Spiral Pipe Bulletin 493.


STD TAYLOR FORGE WELDELL WPA

TF

TAYLOR FORGE

TAYLOR FORGE & PIPE WORKS, P.O. Box 485, Chicago 90, Ill.
Offices in all principal cities.
Eastern Plant: Carnegie, Pa. • *Western Plant:* Fontana, Calif.

☐ **Please send new Catalog 484 covering welding fittings and forged steel flanges.**
☐ **Send new Bulletin 493 covering Taylor Spiral Pipe and related fittings.**

NAME__________

POSITION__________

COMPANY__________

STREET ADDRESS__________

CITY__________ ZONE_____ STATE__________

614-0530 Mail to Taylor Forge & Pipe Works, P. O. Box 485, Chicago 90, Ill.

Stands high
with the crews
that make the news
BRODERICK
FLEX-SET PREFORMED
YELLOW STRAND
BASCOM

Men who work with wire rope on hazardous construction jobs and men who keep production humming inside a plant have one viewpoint in common. Both like the reassurance that rides hoists equipped with *Preformed* Yellow Strand. Your employees will feel the same way. Not only schedules but lives may hinge on any one of this rope's inbred qualities: responsiveness to the operator . . . reserve strength . . . resistance to kinking, whipping and fatigue.

The hoist line for a specific derrick or crane will be dependent upon the string-up, drum and sheave sizes, speed and other conditions. A general rule favors 6x19 or 6x37 *Preformed* Yellow Strand, regular lay, with fiber core for flexibility. If abrasion and drum crushing are factors, as on excavators, another construction may be indicated. Let your B & B distributor help you rig up with long-wearing *Preformed* Yellow Strand.

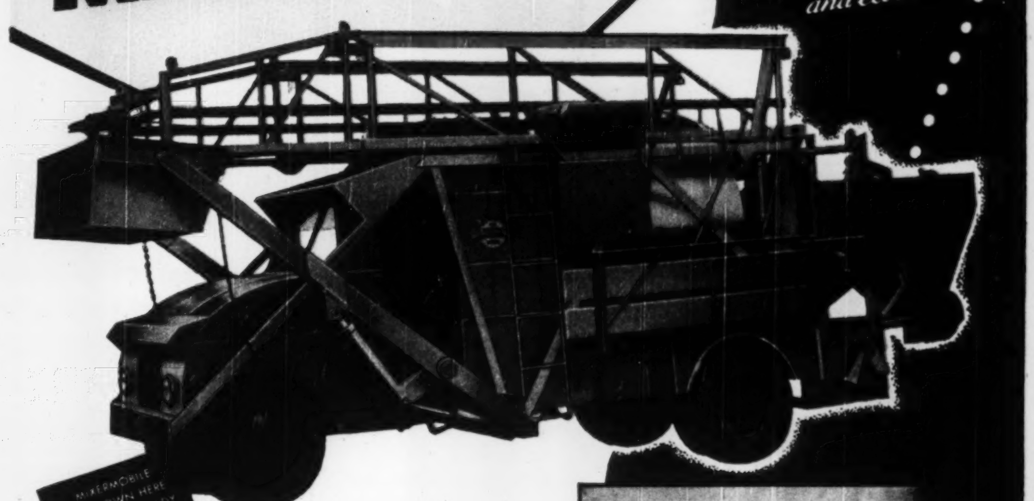
Broderick & Bascom Rope Co., St. Louis 15, Mo.

Branches: New York, Chicago, Houston, Los Angeles, San Francisco,
Portland, Seattle *Factories:* St. Louis, Peoria, Houston, Seattle

BRODERICK & BASCOM
Yellow Strand
PREFORMED WIRE ROPE

It's New.. the one-yard MIXERMOBILE.

A complete mobile concrete mixing unit and elevator



MIXERMOBILE AS SHOWN HERE IS FOLDED — READY FOR TRAVEL

GREATER PROFIT ON EVERY JOB . . .

The new one-yard Mixermobile Model M-6 built to fit all jobs, both small and large. Its complete mobility means more jobs covered every day.

SAVES money by using dump trucks — mixes concrete on the job.
SAVES cost of erecting tower — 35-ft. tower attached.
SAVES cost of hoist and storage hopper — included with tower.
SAVES time — drive to the job, ready to mix in five minutes. When pouring is finished drive to next job.
Turns out 200 cubic yards of concrete per day.

Use MIXERMOBILE — the most economical method of handling concrete on the job. Cuts labor costs — no time wasted waiting for concrete. One man operates complete unit.

FEATURES: HYDRAULIC CONTROLS.
MIXER COMPLETELY ENCLOSED — controlled by specially designed shaft (gears enclosed on outside, no contact with cement.)
POWERED BY V-8 FORD ENGINE.
DISCHARGE TIMER
FOOL-PROOF WATER CONTROL SYSTEM.
WEIGHT — 20,000 lbs.
Will pass all highway limitations.

WRITE TODAY FOR LITERATURE AND YOUR NEAREST DEALER

- 35-FT. TOWER lifts concrete in hoist bucket and empties into tower hopper. Eliminates cost of cranes and moving to and from the job. Extension may be had by special order.
- HYDRAULIC CONTROLLED SKIP holds 1 cu. yd. Loaded directly from dump trucks.

MIXERMOBILE MANUFACTURERS

WAGNERMOBILE

6855 N. E. HALSEY STREET, PORTLAND 16, OREGON

1 Simplified, full-floating charging hopper assembly. Improved seal design assures low maintenance cost.

2 Improved overflow-type water tank; non-breakable gauge glass and non-freeze valves.

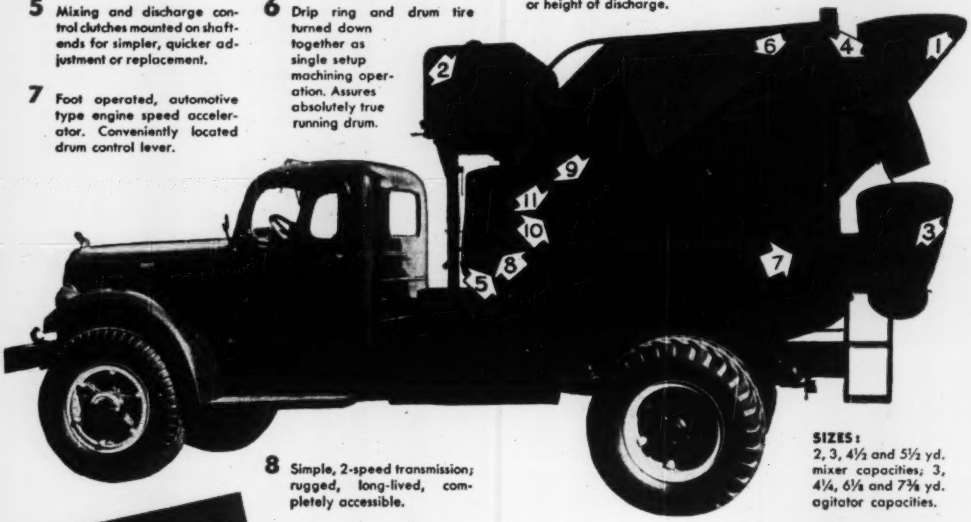
3 Rigid, quick - detachable chute support bracket. Easily swung clear when discharging into hoist buckets; quickly adjustable for slope of chute or height of discharge.

4 Renewable drip ring is quickly, easily, accurately replaced and locked on drip ring flange by 12 cap screws.

5 Mixing and discharge control clutches mounted on shaft-ends for simpler, quicker adjustment or replacement.

6 Drip ring and drum tire turned down together as single setup machining operation. Assures absolutely true running drum.

7 Foot operated, automotive type engine speed accelerator. Conveniently located drum control lever.



8 Simple, 2-speed transmission; rugged, long-lived, completely accessible.

9 Chain-driven drum reduces weight without loss of strength.

10 Trunnion bearing design, with double race bearings for maximum flexibility.

11 Fabricated, all-steel drumhead. Conical section with steel reinforcing ribs absorbs shocks.

SIZES:
2, 3, 4½ and 5½ yd. mixer capacities; 3, 4¼, 6⅛ and 7⅜ yd. agitator capacities.

NEW!

THE 1950 LINE OF *BLUE BRUTES* HI-UPS

Gives You Every Money-Saving Feature!

Men like you helped design this newest Blue Brute Hi-Up! Ready-mix operators throughout the world were consulted, and their very practical suggestions were valuable aids to Worthington-Ransome's century-plus of experience.

The result is an ultra-modern truck mixer — not only a technical triumph in lightness of weight without loss of strength, but an on-the-job performer unequalled for trouble-free operation, easy accessibility of wearing parts and low cost maintenance. The following typical testimonial shows you why:

Our trucking foreman is particularly complimentary of the new Hi-Up's well designed transmission system, including the transmission itself. Our shop service men are complimentary of the unit's ability to properly mix and discharge low slump concretes. We compliment you on a well engineered and well designed truck mixer.

SOUTHERN MATERIALS CO., INC.
J. W. Roberts, *Vice President*

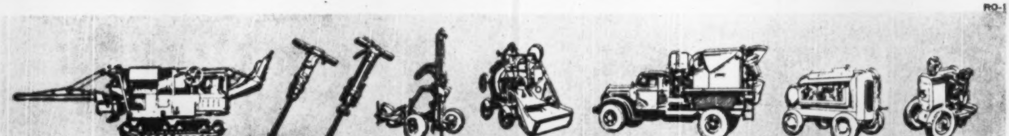
Give the new Hi-Up's features a good going-over — one by one. You'll agree that they add up to more concrete at lower cost — and that *there's more worth in a Blue Brute.* For further facts, see your nearby Worthington-Ransome Distributor, or write for Bulletin.

WORTHINGTON

Worthington Pump and Machinery Corp.
Construction Equipment Department
Harrison, New Jersey
Distributors In All Principal Cities

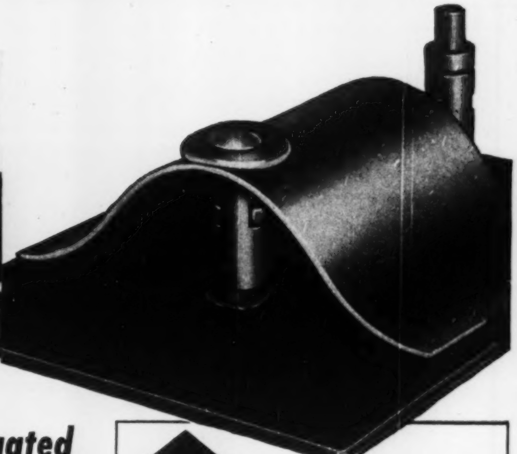
BUY BLUE BRUTES

RO-1



IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

NELSON "Rivweld" Method Cuts Roofing Application Costs!



Produce Better Jobs! Apply Corrugated Iron, Aluminum, or Protected Metal with NELSON "RIVWELD" STUDS

Roofing contractors are *staying on top of the job* with the Nelson "Rivweld" method of fastening. The result, in every case, is a better job, done faster, at substantial savings in cost.

Because all work is done entirely from the top-side of the roof, no inside scaffolding or rigging is required, no workmen are needed under the roof.

In this simplified "production line" method, Nelson "Rivweld" rivet studs are quickly end-welded to the purlins with the lightweight Nelson Gun. The corrugated metal is then impaled over the rivet extensions which are upset to form a weathertight job.

TYPICAL RESULTS: One contractor reports a saving of over $2.00 per square in applying corrugated iron roofing to a large factory building. Another contractor writes: "Our cost records show we have saved a minimum of 20% in application costs on every one of the scores of jobs on which we've used the Nelson method."

The Nelson Method of Fastening is also widely used for applying corrugated asbestos roofing and siding; for installing sprinkler and piping systems; conduit and wireways; insulations of all types.

RENT IT—TRY IT! Nelson Stud Welding equipment may now be rented for only $45 a month. Use the coupon to get complete details about this plan and the Nelson cost-saving method of fastening.

NELSON STUD WELDING

Division of Morton Gregory Corporation
2751 Toledo Avenue Lorain, Ohio

NELWELD

NEW COMPOSITE STUD

for applying Corrugated Aluminum roofing and siding prevents corroding. Made up of a cadmium-plated flux-filled mild steel base or body and an aluminum insert. An aluminum washer is placed over the stud before the latter is riveted over to secure the sheet. This construction practically eliminates the possibility of electrolytic action.

GET ALL THE FACTS NOW!

NELSON STUD WELDING
Division of Morton Gregory Corporation
2751 Toledo Avenue, Lorain, Ohio

Send complete information about Nelson Stud Welding for the following roofing and siding materials:

☐ Corrugated Iron
☐ Corrugated Aluminum
☐ Corrugated Protected Metal
☐ Corrugated Asbestos

Name ______________________________

Company ___________________________

Address ____________________________

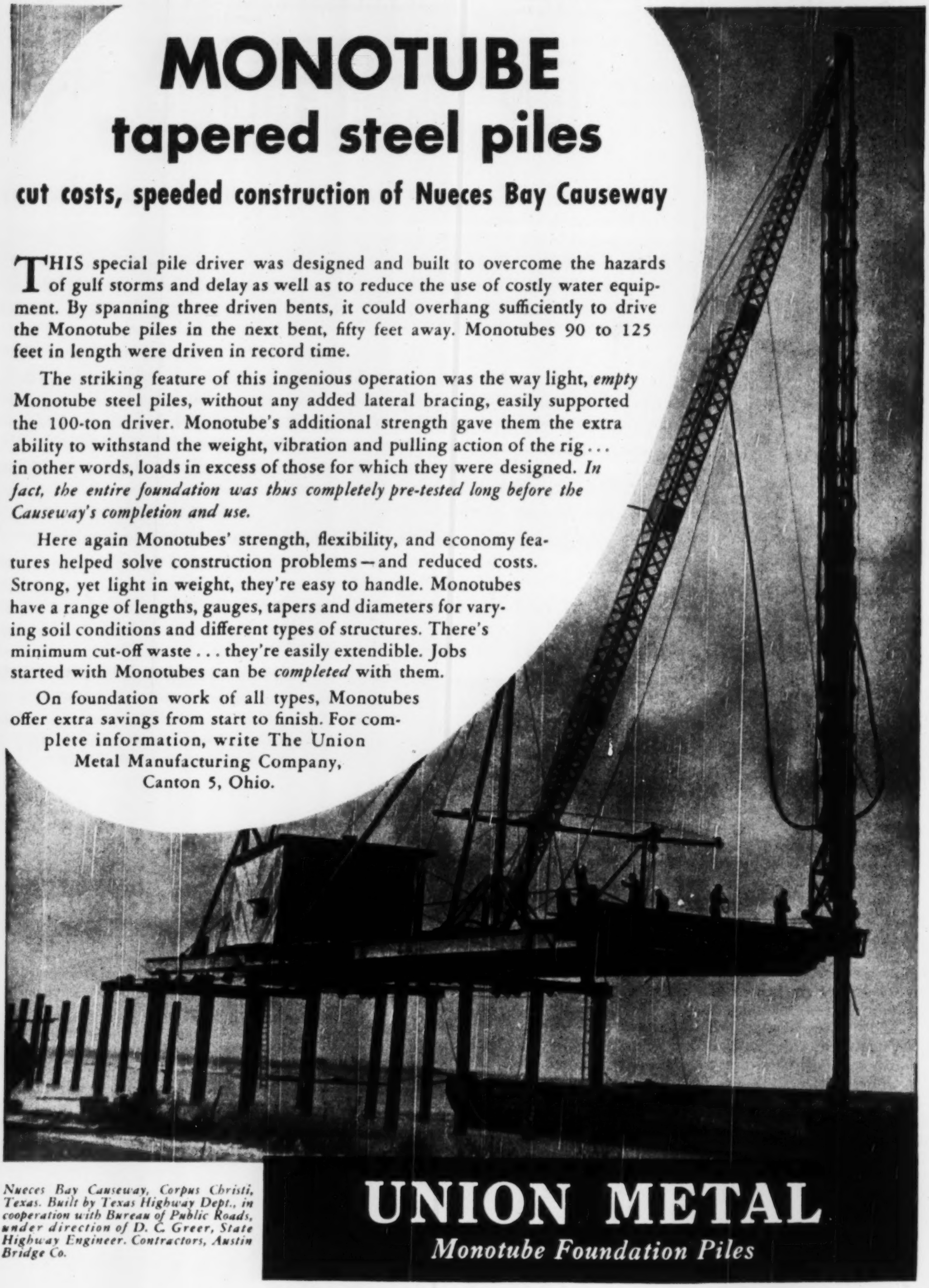
City ________________ *State* ________

Strong enough EMPTY to support a 100-ton rig!

MONOTUBE

tapered steel piles

cut costs, speeded construction of Nueces Bay Causeway



THIS special pile driver was designed and built to overcome the hazards of gulf storms and delay as well as to reduce the use of costly water equipment. By spanning three driven bents, it could overhang sufficiently to drive the Monotube piles in the next bent, fifty feet away. Monotubes 90 to 125 feet in length were driven in record time.

The striking feature of this ingenious operation was the way light, *empty* Monotube steel piles, without any added lateral bracing, easily supported the 100-ton driver. Monotube's additional strength gave them the extra ability to withstand the weight, vibration and pulling action of the rig . . . in other words, loads in excess of those for which they were designed. *In fact, the entire foundation was thus completely pre-tested long before the Causeway's completion and use.*

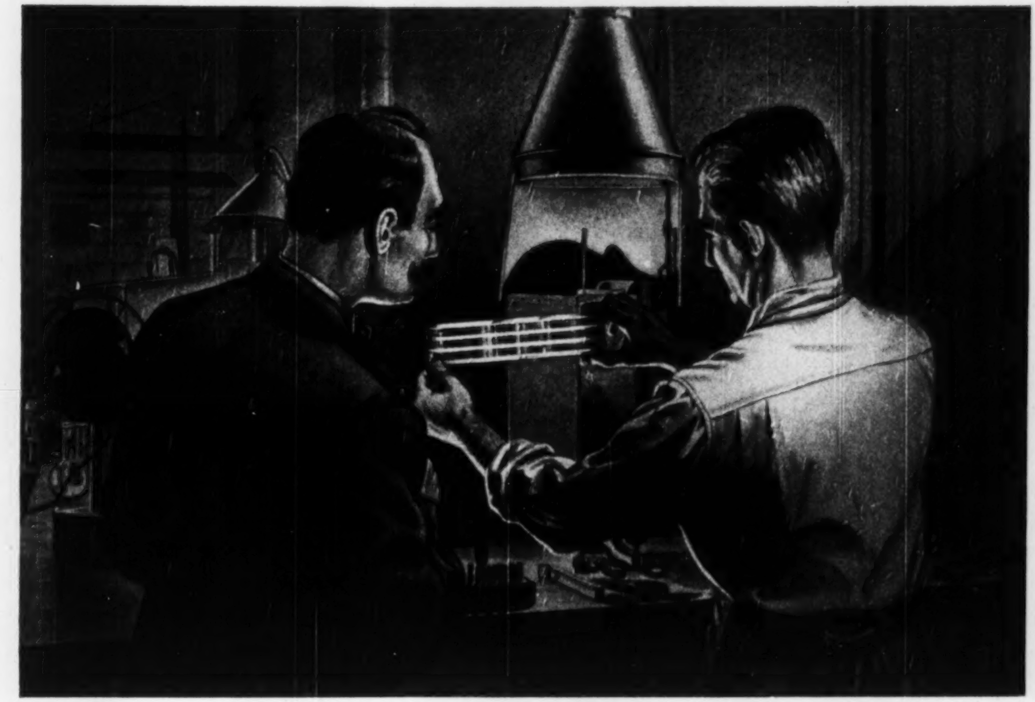
Here again Monotubes' strength, flexibility, and economy features helped solve construction problems—and reduced costs. Strong, yet light in weight, they're easy to handle. Monotubes have a range of lengths, gauges, tapers and diameters for varying soil conditions and different types of structures. There's minimum cut-off waste . . . they're easily extendible. Jobs started with Monotubes can be *completed* with them.

On foundation work of all types, Monotubes offer extra savings from start to finish. For complete information, write The Union Metal Manufacturing Company, Canton 5, Ohio.

Nueces Bay Causeway, Corpus Christi, Texas. Built by Texas Highway Dept., in cooperation with Bureau of Public Roads, under direction of D. C. Greer, State Highway Engineer. Contractors, Austin Bridge Co.

UNION METAL

Monotube Foundation Piles



Look at this Exide spectrogram*, Mr. Diesel

See how accurately . . . and to what minute degree . . . every element in the lead is measured.

What and *how much* are important to know. For a very small percentage of certain elements can affect battery performance and life.

Yet spectrum analysis is but one example of the great care taken by Exide to produce a battery with the mighty cranking power that Diesel starting demands.

Exide Batteries have that power. Test after test proves it. Especially the final performance tests, which are tough, rugged, brutal . . . much more severe than the battery will have to meet in service.

Exide Diesel Cranking Batteries pass those tests with credits to spare. That's why you can count on Exides for a quick breakaway and a high cranking speed.

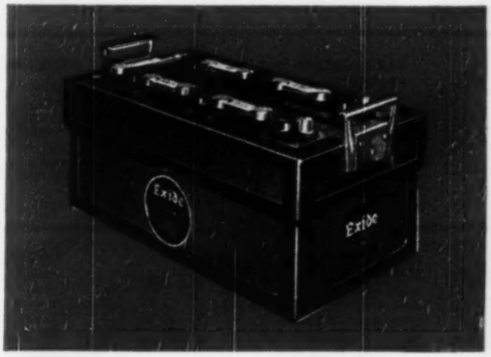
It's also the reason why so many makers and users of Diesel engines choose Exide Batteries . . . why these batteries are best for you.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

* **DEVELOPMENT WORK NEVER CEASES** in improving the performance of Exide Batteries. Our staff of engineers, chemists, metallurgists, physicists and technicians is the largest in the battery industry.

"Exide" *Reg. Trade-mark U. S. Pat. Off.*

1888 . . . DEPENDABLE BATTERIES FOR 62 YEARS . . . 1950



Big Bruisers

LOOK UNDER THE HIDE

When buying, look under the hide to see what you're getting. Foresight is cheaper than hindsight.

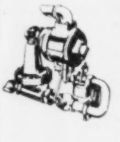
INDIVIDUAL FUEL INJECTION PUMPS for each cylinder — meter the fuel, time the injection, and provide accurate injection pressure. Pumps operate at half engine speed — an important factor in their long life.

NON-CLOGGING, SINGLE-ORIFICE FUEL INJECTION VALVES give clean, efficient combustion throughout the entire operating range of the engine — low idle, part load or full load. They are non-adjustable and interchangeable.

METAL-EDGE TYPE OIL FILTERS consist of four nested parts which provide a large filtering area. The full oil flow passes through these filters continuously, allowing no chance for harmful particles to be circulated by the oil stream.

ABSORBENT TYPE FUEL FILTERS consist of a filter paper covered core wound with cotton yarn in a closely controlled pattern so that the entire depth catches and holds even the finest abrasive particles. The low-cost filter elements safeguard the fuel injection parts.

CONVENIENT FUEL PRIMING PUMPS and air bleed valves enable the fuel system to be bled with very little effort. A glass window makes it easy to tell when all air has been removed.



AIR STARTING consists of a vane type air motor which cranks the Diesel through a Bendix type drive engaging the flywheel ring gear. The motor, air pressure regulator, oiler, and control valve may be mounted on either side of the engine.

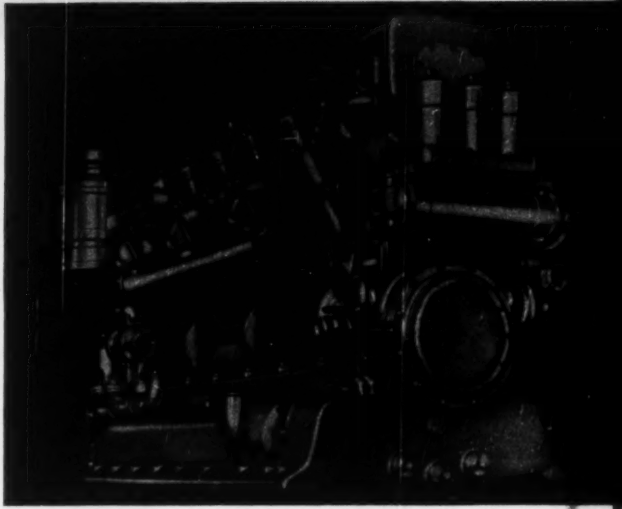
ELECTRIC STARTING consists of two 32-volt motors mounted on each side of the engine. As in the case of air starting, the Diesel is cranked through a Bendix type drive.

NEED Big Muscles

LOADING, lifting and swinging a full 7-yard load from the end of a 120-foot boom is no "pantie-waist" exhibition. For handling such big bites, the Ruby Construction Company, Inc., repowered their giant Bucyrus-Monighan dragline with the big new 400-horsepower "Caterpillar" D386 Engine. Because of the power and lugging ability of the "Cat" Diesel, bucket size was increased from the original 5-yard capacity. With its more "muscular" "Cat" Diesel, the outfit has moved more earth at a faster rate than it has ever done before.

The D386 and the still more powerful D397 (500 hp.) have extended the line of "Caterpillar" Diesels to meet a much wider range of power requirements. Built in "Caterpillar's" huge new engine factory, "Caterpillar" Diesels offer you many exclusive, profit-making features. By specifying "Cat" Diesels on your equipment orders, you are assured maximum economy, utmost dependability, and lowest maintenance costs.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS



SPECIFY "CATERPILLAR" DIESEL POWER IN THE NEW EQUIPMENT YOU BUY – AND FOR REPLACEMENT IN THE EQUIPMENT YOU ALREADY HAVE.

CONSIDER the quick and efficient parts-and-repair service that is available to you (no matter where your headquarters or jobs are located).

USE THE COUPON for specifications and other information on "Cat" Diesels. No obligation.

CATERPILLAR
REG. U. S. PAT. OFF.

DIESEL

ENGINES • TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

CATERPILLAR TRACTOR CO., Box EN-3, Peoria, Ill.

Send specification sheets on "Caterpillar" Diesel Engine models and sizes.

*Name*____________________________

*Address*____________________________

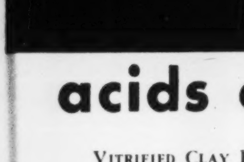
acids can't affect CLAY PIPE

VITRIFIED CLAY PIPE provides the only *sure* protection against costly, dangerous acid attack. "Inside and out," it's chemically inert — absolutely immune to corrosion, rust, or decomposition. In a recent survey of 122 leading American cities, it was found that 89% of the existing sewers are Vitrified Clay Pipe lines. *And there is not one instance on record of a single length of Clay Pipe wearing out due to acid attack.* It pays to play safe . . . to guard against the dangerous acids and alkalies found in sewage and ground waters. Be *sure* by specifying Vitrified Clay Pipe — the *only* pipe that never wears out.

NATIONAL CLAY PIPE MANUFACTURERS, INC.
1105 Huntington Bank Bldg., Columbus 15, Ohio
703 Ninth and Hill Bldg., Los Angeles 15, Calif.
100 N. LaSalle St., Rm. 2100, Chicago 2, Ill.
206 Connally Bldg., Atlanta 3, Ga.

SPECIFY

Vitrified
CLAY
CLAY PIPE NEVER WEARS OUT!
PIPE

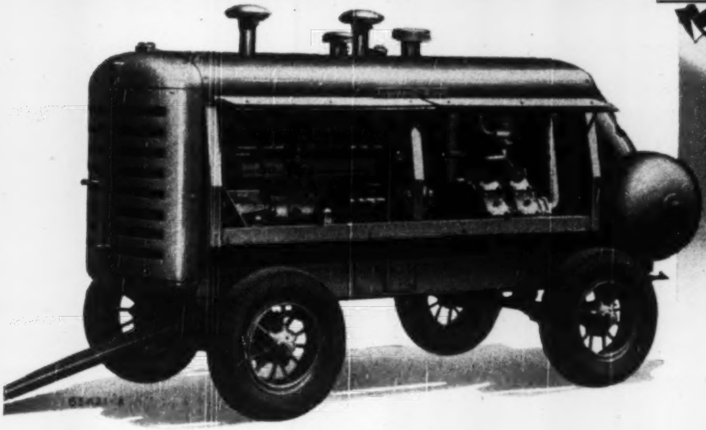


LINER PLATES

STANDARD-STRENGTH CLAY PIPE

CLAY PIPE FITTINGS

C-250-2



New **500** *cfm*

Ingersoll-Rand
MOBIL-AIR
AIR POWER

the IKA-500 with the UD-24 International-Harvester Diesel Engine

... the latest addition to the

IR CONTRACTORS' COMBINATION*

Easy-Starting International-Harvester Diesel Engine ... Starts as a gasoline engine and, by means of a single lever, is switched to full-diesel operation.

Floating-Speed "Drill-More" Regulator .... saves up to 40% in fuel and allows air tools to do 30% more work by maintaining 15- to 20-psi higher average air pressure. This new regulator holds the rated pressure of 100 psi at full compressor capacity.

Other Sup-IR-features ... Self-adjusting Hydro-Shift Flex-Disc Clutch ... Two-Stage Air-Cooled Compressor with Channel Valves and Piston-Type Free-Air Unloaders ... extra strong frame and running gear.

Now you can get Ingersoll-Rand's famous 500-cfm Mobil-Air Compressor with the well-known International-Harvester UD-24 full diesel engine. Ruggedness, dependability and economical operation are combined in this new Air Power unit. It is made to order for wagon-drill work on dams, tunnels and other big jobs requiring a lot of air continuously at full pressure.

The UD-24 diesel provides sufficient reserve power to assure full compressor capacity at rated pressure under these heavy loads even with widely varying weather and altitude conditions.

This new Mobil-Air will operate two Ingersoll-Rand FM-2 Heavy Wagon Drills or five I-R Wagonjacks. Under a smaller air tool load the IKA-500 will operate as economically as a smaller portable because the Drill-More "Floating-Speed" Regulator automatically slows down the compressor to the exact speed needed.

Here's the big portable you have been looking for. Ask your Mobil-Air distributor for more information, or write or phone your nearest Ingersoll-Rand branch office.

*

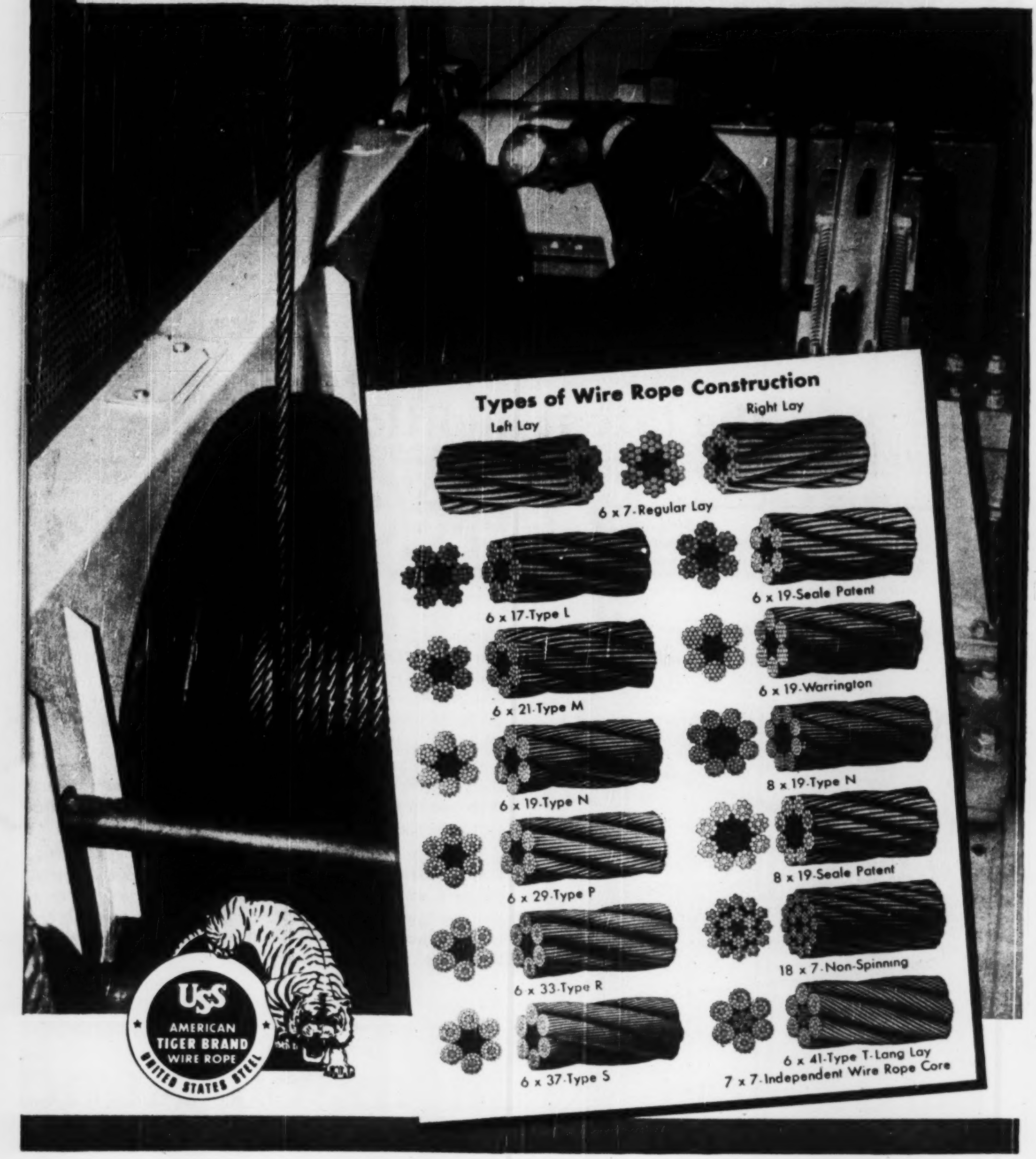
- *Everything you need for rock drilling.*
- *Top quality machines that work as a team.*
- *Machines designed, built, sold and serviced by men who know rock excavation ... application "know how"*

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

483-2

The Tiger Brand Specialist says-


Types of Wire Rope Construction
Left Lay
Right Lay
6 x 7-Regular Lay
6 x 17-Type L
6 x 19-Seale Patent
6 x 21-Type M
6 x 19-Warrington
6 x 19-Type N
8 x 19-Type N
6 x 29-Type P
8 x 19-Seale Patent
6 x 33-Type R
18 x 7-Non-Spinning
6 x 37-Type S
6 x 41-Type T-Lang Lay
7 x 7-Independent Wire Rope Core
USS
AMERICAN
TIGER BRAND
WIRE ROPE
UNITED STATES STEEL

"Here's what you should know about wire rope —and how to select, use and care for it."

THE three most important qualities that wire rope must possess are (1) strength, (2) fatigue resistance, and (3) abrasion resistance. Whether the rope is used on hoists, cranes, excavators, conveyors, loaders or unloaders, these properties are required in varying degrees depending on serivce requirements.

STRENGTH—This is determined by size, grade, and construction. Wire for wire rope can be made in any desired tensile strength ranging from iron grade at approximately 100,000 lbs. per sq. in. to improved plow steel grade at approximately 250,000 lbs. per sq. in. The knack of making Tiger Brand Ropes with uniform strength throughout shows the skill of the wire rope manufacturer.

FATIGUE RESISTANCE—The ability to make wire that will stand thousands of bends over drums and sheaves without breaking is no small accomplishment. The wire must be made with just the right amount of toughness and ductility. Tiger Brand Wire Rope is made from wire especially fabricated for wire rope use. Ropes composed of a large number of small wires will have higher fatigue resistance than those made with a smaller number of large wires.

ABRASION RESISTANCE—This is determined by the size and chemistry of the wires, especially the outer wires as they are exposed to the most wear. Obviously, the larger the wire size the greater the resistance to abrasion. Furthermore, the high strength steels are better able to withstand wear because of a greater carbon content. This means that improved plow steel ropes would have the highest abrasion resistance.

Getting the right balance

Individually, the properties of strength, fatigue resistance, and abrasion resistance are not difficult to obtain . . . but in wire rope making, it is impossible to accent one property without detriment to the other two. That's why the skill and experience of the men who make Tiger Brand Wire Rope are so important. Satisfactory performance demands that running ropes possess all three properties and therefore it is necessary to obtain an effective balance which meets the requirements of your particular job.

How to get longer wire rope life

Don't overload the rope.

Don't subject the rope to sudden impact loads.

Don't use undersize sheaves and drums—this is the commonest cause of fatigue breaks.

If vibration is present, make regular cuts from the end of the rope so as to change the dampened section.

Keep groove diameters proper size so as to avoid pinching of rope.

Avoid flange wear as a result of bad sheave alignment.

If grooves become fluted, it is usually a sign that the sheaves should be replaced with a harder material.

Lubricate regularly. Wire rope is a machine and requires adequate lubrication. It must also be protected from corrosion to retain strength.

Avoid kinking, improperly attached fittings, and uneven drum winding.

Make use of the Tiger Brand Wire Rope Specialist

It is very much to your advantage and to ours to maintain good operating practices. Call in the Tiger Brand Specialist at regular intervals and have him give you a FREE Check-up. He is thoroughly experienced in proper wire rope application.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

AMERICAN
TIGER BRAND
WIRE ROPE

Send for FREE BOOKLET

American Steel & Wire Company
Rockefeller Building, Dept. A-30
Cleveland 13, Ohio

Please send me a copy of your catalog, "American Tiger Brand Wire Rope."

Name...

Company...

Position..

Address...

City.........................State...............

AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

THERE WAS AN OLD CITY...

THE problem of the old woman who lived in a shoe has been dumped in the laps of American city planners. What to do about the continuing expansion of industry . . . the rapid growth of urban populations?

Modern, up-to-the-minute map information is the first step toward the answer. In most cities, existing maps have long ago outgrown their usefulness and the cost of collecting new map data is high in terms of time and money.

Aerial photography, however, can solve your mapping problems swiftly and economically. *At less than half the cost* and in a fraction of the time required of ground surveys, AERO's exclusive glass plate process is providing the city of Cleveland with aerial topographic maps that meet the most rigid demands of engineering accuracy.

Precision aerial maps by AERO can help you plan your city's future with the finest map facts available to science . . . at the lowest possible cost to the taxpayer.

Let AERO's engineers bring thirty years of photogrammetric experience to your city planning staff. It will help you build a better place to live in. Write Aero Service Corporation, today.

AERO MAPS THE FUTURE

AERO
SERVICE CORPORATION
236 E. COURTLAND ST., PHILA. 20, PA.
Oldest Flying Corporation in the World

TOPOGRAPHIC MAPS • PLANIMETRIC MAPS • PRECISE AERIAL MOSAICS • AIRBORNE MAGNETOMETER SURVEYS • RELIEF MODELS • COLOR PHOTOGRAPHY

Ant's-eye view
of

SOUND CONSTRUCTION

Made for LONG SERVICE LIFE with LESS MAINTENANCE

Amcreco
Lowry Process
Creosoted
Products

TIMBERS PILES PLANKING
FRAMED BRIDGE TIMBERS
POLES CROSS ARMS CONDUIT
ADZED AND BORED CROSS TIES
BRIDGE TIES

Strength and durability in the basic foundation builds soundness into your construction jobs. That's why Amcreco Creosoted Products are selected from the soundest timber — pressure treated by an advanced technique based on the Lowry Process—to assure enduring, long-lasting bridge work and freedom from maintenance troubles. As an added benefit, Amcreco Creosoted Piles, Framed Bridge Timbers and Planking economize in first cost, permit speedier erection. For economical "life insurance" on your next bridge job, specify Amcreco.

Pressure-treated
for
strength that lasts!

AMERICAN CREOSOTING COMPANY
INCORPORATED
COLONIAL CREOSOTING COMPANY INCORPORATED
GEORGIA CREOSOTING COMPANY INCORPORATED
LOUISVILLE, KENTUCKY

New! BAKER engine
for the ALLIS-CHALMERS
BAKER

mounted Bulldozers and Gradebuilders

HD-5 TRACTOR

They're here — sensational, new Baker Bulldozers and Gradebuilders, ready for your job whatever it may be within the range of the Allis-Chalmers HD-5 tractor. They're engine mounted and they pack a terrific wallop — they're well balanced, extra sturdy, and built for big volume, tough earthmoving.

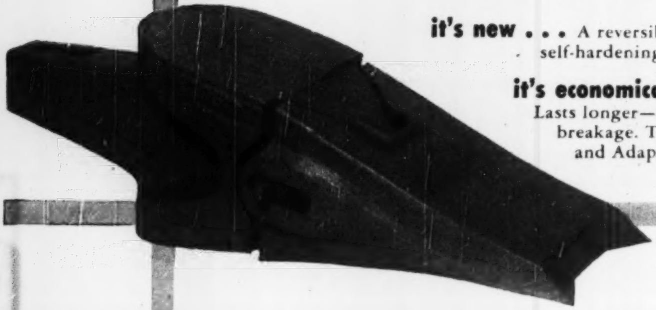
This new Baker design brings you everything you've always wanted in a bulldozer — the simple, fast acting, most dependable hydraulic control system in the business — finger-tip, precision control of the blade — unimpaired visibility—direct lift with plenty of down-pressure for tough digging — extra operator comfort and convenience, and balance that converts every ounce of tractor power into push on the blade.

Built into the HD-5, these new Bakers provide new standards of performance, economy and all-around utility. Before you buy ANY bulldozer, check over these new Bakers at your Allis-Chalmers dealer or write direct for Bulletin 881, Baker Mfg. Co., Springfield, Illinois.

Announcing...

The Amsco® Rever-SharP

The first important reversible dipper tooth improvement made in years!



it's new . . . A reversible, self-sharpening and self-hardening tooth.

it's economical . . . Improves digging efficiency. Lasts longer—with higher resistance to breakage. Tips made of Chromanal; Shanks and Adaptors of Manganese Steel.

FEATURES OF THE AMSCO REVER-SHARP THAT LOWER HANDLING COSTS PER TON

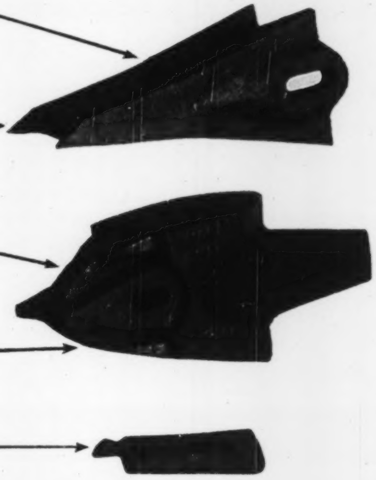
Reversible Tip—Simply turn the tip over when worn. A new, sharp cutting edge is ready for use. Made of Chromanal, the metal that actually work-hardens in service. *The harder you use the Rever-SharP, the harder it gets!*

Unique Cutting Edges—Increase service life and cutting efficiency from 50 to 200%. Reinforced and extended corners take initial impact and work-harden faster; wear is equalized along entire cutting edge.

Special Adaptor—Made of AMSCO Manganese Steel and designed so that extra metal protects base connections and lip from wear. Available to fit all base connections.

Reinforced Nose—Supported along entire length by extended ribs. Protects against bending or breakage. Tip is self-tightening as it is forced against the tapered nose during use.

Trigger Lock-Key—Tapered for easy insertion and removal. Rubber insert prevents loosening in service.

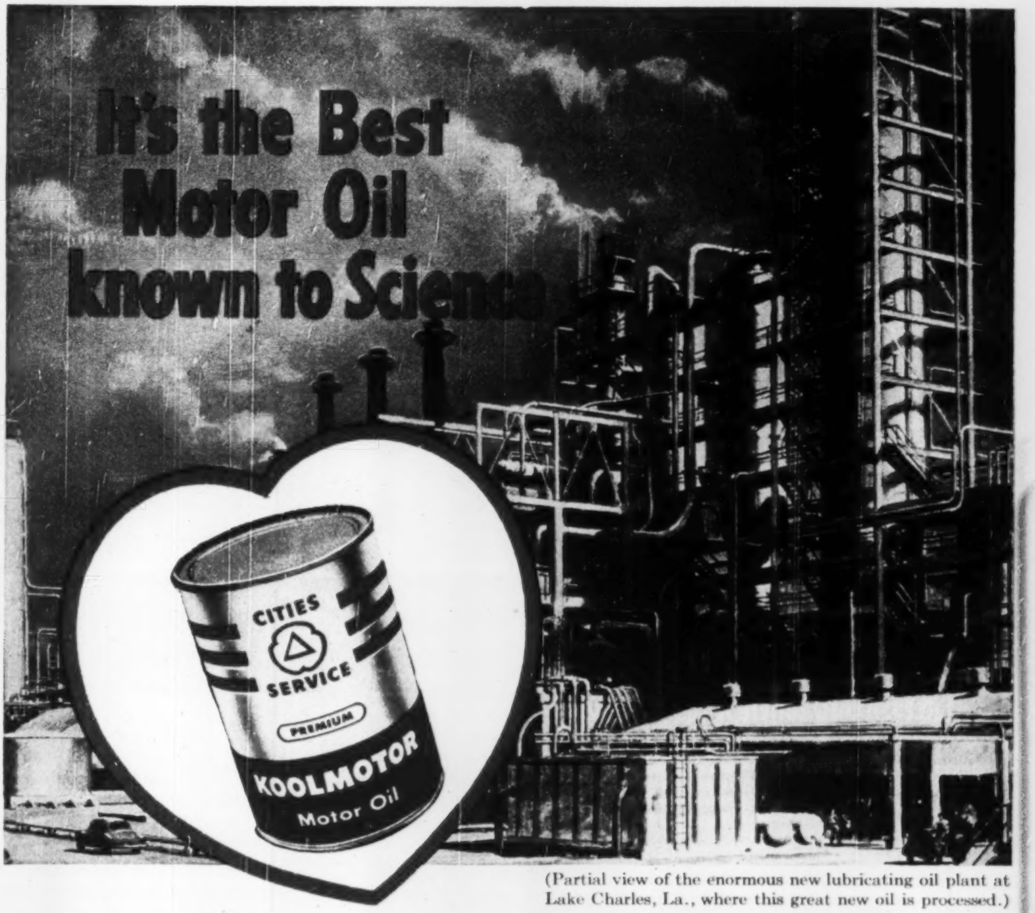


REVER-SHARP ALREADY IN USE—AND SERVICE-PROVED

Acceptance of the Rever-SharP is enthusiastic—*one user reports 6 times the service of former teeth.* Get the complete facts on this new, better dipper tooth. Write today for complete information.

AMERICAN
Brake Shoe
COMPANY

AMERICAN MANGANESE STEEL DIVISION
379 EAST 14th STREET • CHICAGO HEIGHTS, ILL.



(Partial view of the enormous new lubricating oil plant at Lake Charles, La., where this great new oil is processed.)

"ANTI-FOULING" OIL made by the Remarkable new "HEART-CUT" PROCESS

This new oil—the best known to science... gives you a cleaner engine...more economy ...minimum carbon residue.

CITIES
SERVICE

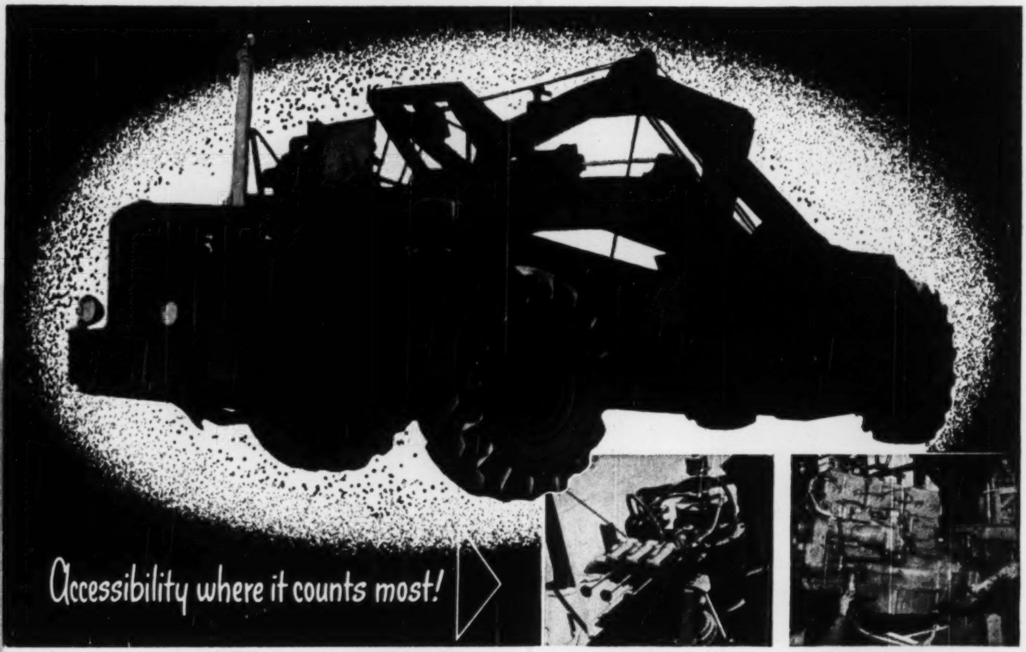
It's here now! The remarkable motor oil from the giant new $42,000,000 lubricating oil plant at Lake Charles, La. The plant that's been the big talk of the oil industry for months.

New Premium Koolmotor is made by the unique "Heart-Cut" Process which retains only the choicest part of the finest crudes. *It's so superior that in recent engine tests it outscored nine other major premium motor oils.* No wonder Premium Koolmotor is better in every way! Cleans better, seals better, cools better and fights acid, sludge and corrosion far more effectively. Switch to this remarkable new oil today.

start saving Dollars today...stop at

CITIES SERVICE

EASIER MAINTENANCE is a vital part of Terra Cobra PERFORMANCE LEADERSHIP



CABLES always accessible. Straight reeving, fewer sheaves, all away from dirt. Result: Longer cable life, less "down time."

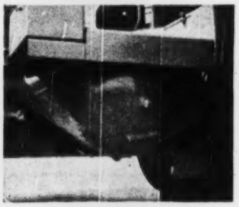
POWER CONTROL UNIT easily adjusted from outside without special tools. Entire assembly removable without disturbing other units.

DEPENDABLE CUMMINS DIESEL ENGINE requires minimum maintenance, easily inspected or removed. Fuel, lube and air filters readily accessible.

Where a few minutes of "down time" can quickly eat up the profits, rugged dependability and *simplified maintenance* are essential in earth-moving equipment. That's why reserve strength *and accessibility* have been engineered into every feature of the Wooldridge Terra Cobra. Every major component can be easily reached or removed without disturbing unrelated parts. Cost-wise contractors have proved that this means *less* servicing, *faster* maintenance, *more* productive time, *higher* profits. Ask your Wooldridge distributor for complete details—or write today for Bulletin No. TC-705.

WOOLDRIDGE MANUFACTURING CO.
Sunnyvale, Calif. • 4710 W. Division St., Chicago 51, Ill.

RUGGED TRANSMISSION may be inspected or removed without disturbing engine, differential or other major units.



MASSIVE DIFFERENTIAL accessible at all times. May be removed in a matter of minutes without affecting transmission.

Scrapers • Bulldozers • Rippers • Power Control Units

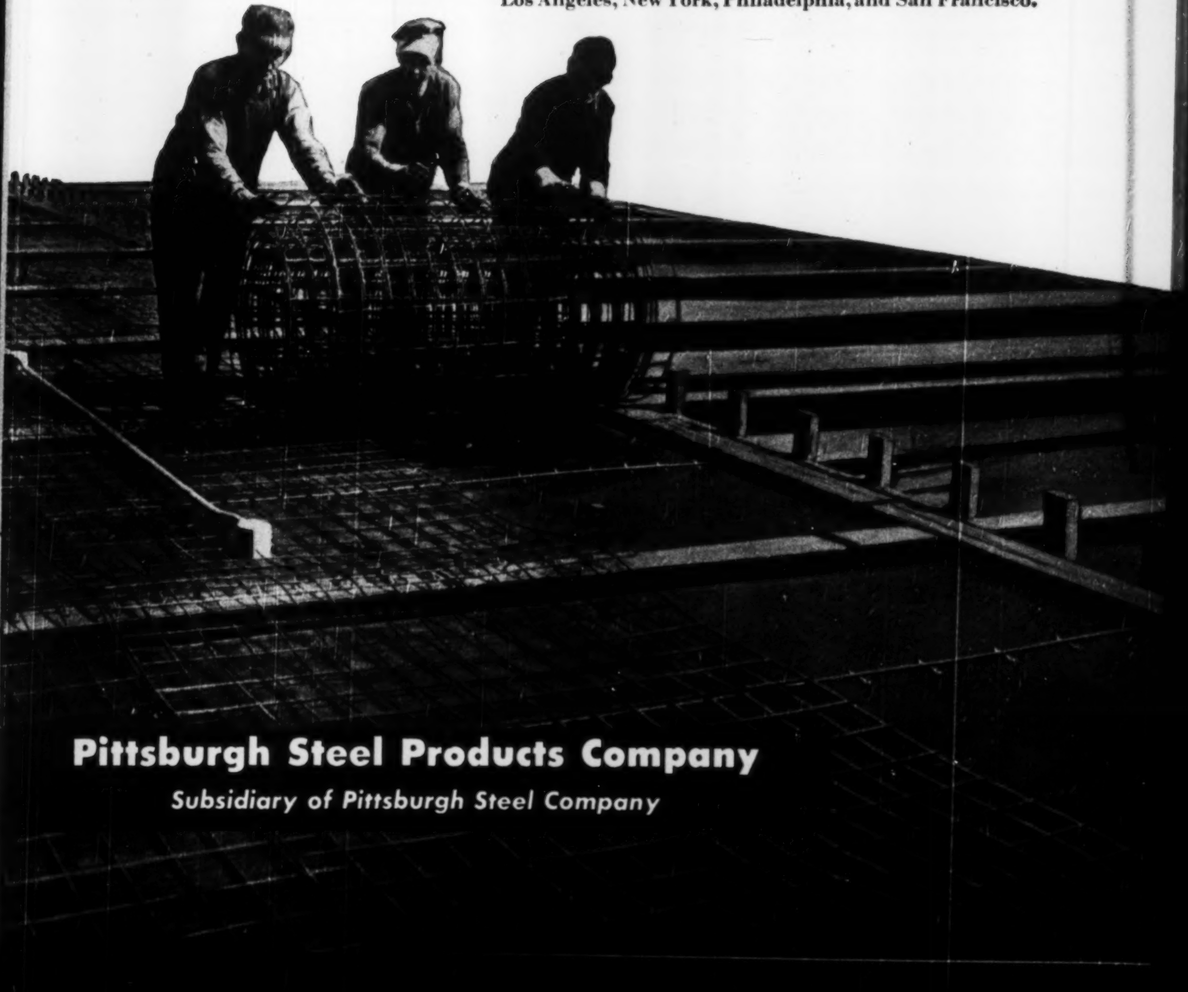
WOOLDRIDGE
EARTH MOVING EQUIPMENT

PROVED AND APPROVED FOR EVERY TYPE OF EARTH-MOVING JOB

For All Enduring Floors Use

Pittsburgh *Welded* Reinforcement

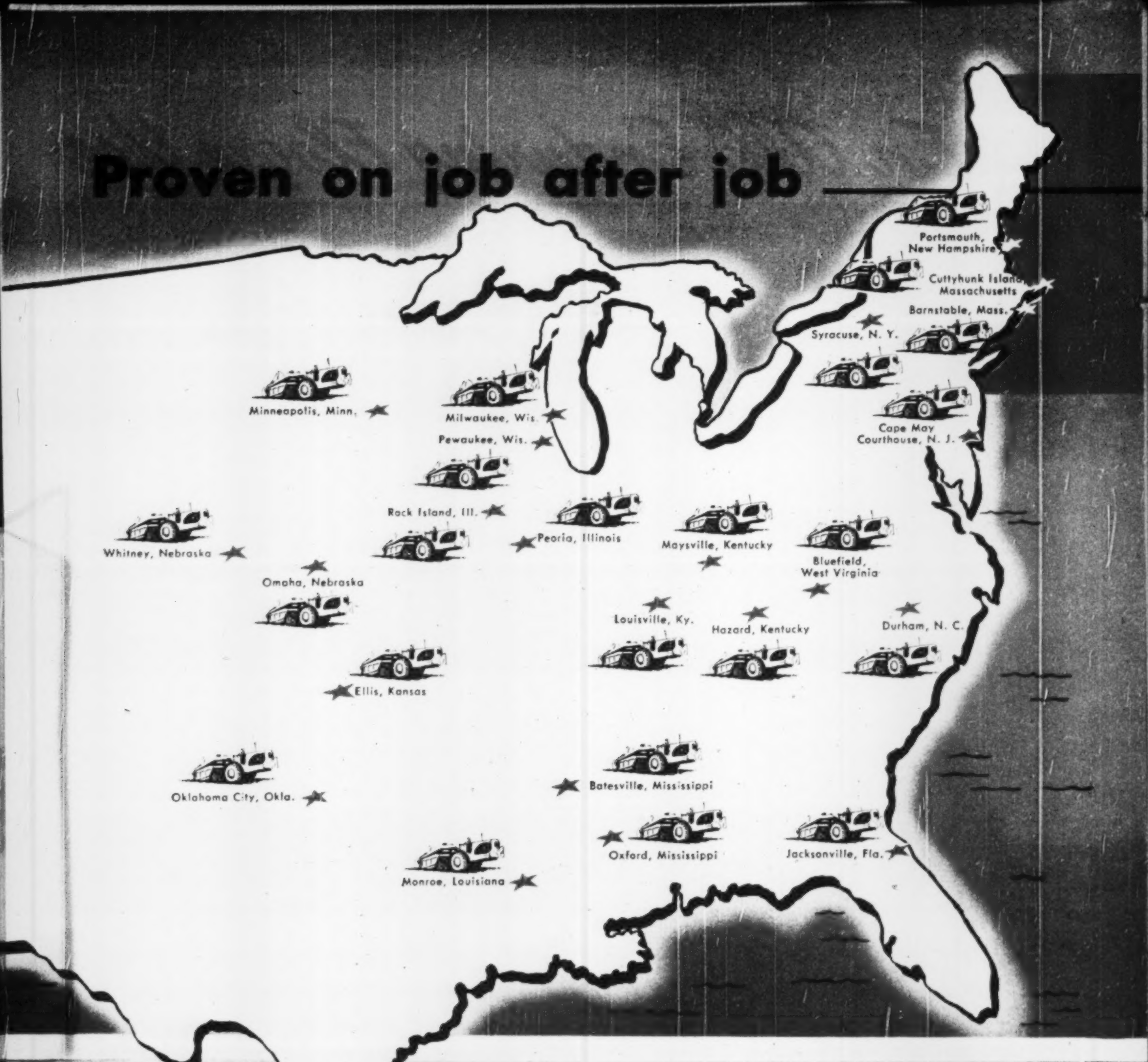
To guard against expensive cracking in concrete floors use Pittsburgh Welded Reinforcement. This strong welded wire reinforcement is designed to give your floors the strength they need for long service. For better floors specify Pittsburgh Welded Reinforcement. Send your inquiry to Pittsburgh Steel Products Company, Grant Building, Pittsburgh 30, Pa., or to our nearest office in Atlanta, Chicago, Columbus, Dallas, Detroit, Los Angeles, New York, Philadelphia, and San Francisco.



Pittsburgh Steel Products Company

Subsidiary of Pittsburgh Steel Company

Proven on job after job


Portsmouth, New Hampshire
Cuttyhunk Island, Massachusetts
Barnstable, Mass.
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At Polecat Creek, Oklahoma, on the $2,690,000 Heyburn Dam job, Heiliners hauled heaped loads on faster cycles for lower costs. The Heiliner is available with an 18-cu. yd. scraper or bottom-dump wagon.

Heiliners

move more dirt ...faster at less cost

You make more money on your dirt, with Heiliners on the job. They haul the biggest loads at the lowest cost per yard. Operating records of contractors on the toughest jobs in the country prove it.

Heiliners have what it takes to pay out in all kinds of weather, over all kinds of ground and fill conditions:

1. **Power-packed 200 h.p. Cummins Diesel.** Gives you high top-speed and plenty of lugging ability for faster haul cycles.
2. **Sure-footed drive wheels.** Give you full traction. 21:00 x 29 tires provide ample flotation on loose fill and in heavy going.
3. **Super-axle construction.** Provides low-torque drive for maximum power. Accessibility of axle shafts and wheel drive-gears cuts maintenance.
4. **Easy, passenger-car steering.** Patented Hydro-Steer makes handling effortless, reduces operator fatigue, increases safety.
5. **Heiliner power control-unit.** Provides finger-tip control for bigger loads, faster dumping.

Carry more pay yards, get faster haul cycles, make more money. Put these and many other Heiliner features to work for you. Use Heiliners on all your jobs.

Ask your distributor for the full story on the Heiliner and Heil's complete line of earthmoving equipment. Or write today for bulletins.

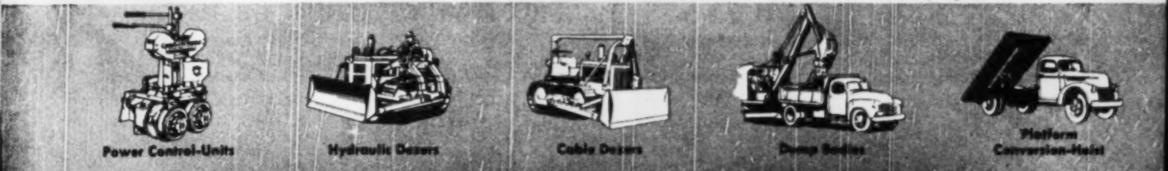
THE HEIL CO.

DEPT. 130, 3001 W. MONTANA AVENUE, MILWAUKEE 1, WISCONSIN

Factories: Milwaukee — Hillside, N. J.

District Offices: Hillside, Washington, D. C., Atlanta, Milwaukee, Detroit, Chicago, Minneapolis, Kansas City, Dallas, Los Angeles, Seattle.

R-109



REPEAT ORDERS
FROM ALL OVER THE COUNTRY...

PROVE HENDRIX BUCKETS ARE THE BEST

**3 TYPES
FOR EVERY DIGGING
PURPOSE**

**3/8 to 40
CUBIC YARDS**

The large percentage of "repeat orders" for Hendrix Dragline Buckets are real evidence of satisfaction. Their outstanding performance of deliverying more pay dirt at lower cost makes them the first choice of progressive producers. Hendrix Buckets are engineered and designed to give years of low-cost, high-profit operation with the minimum of maintenance. Repeat orders prove Hendrix Buckets are best!

For descriptive literature ask your dealer or write

HENDRIX
Lightweight **DRAGLINE
BUCKETS**

HENDRIX MANUFACTURING CO., INC.

MANSFIELD — LOUISIANA

for Safety, Surety and Savings

...OPERATE DISTANT VALVES

by LIMITORQUE REMOTE CONTROL

Push-Button
CONTROL

Shown above is a Crane Co. Type "S" Pressure-Seal Gate Valve.

The important safety factor afforded by *LimiTorque Remote Control* cannot be overstressed, because men do *not* have to go to high, low, dangerous or inaccessible locations to open and close valves. Further, *LimiTorque* prevents damage to seats, discs, stems, etc., because it *"automatically" shuts-off the power,* should an obstruction in closing occur.

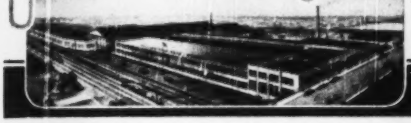
Think of the savings effected in time and money by eliminating men going from one valve to another (many of which are at distant locations)—not to mention the time required to shut or open each valve. *LimiTorque Remote Control* not only prevents this waste, but enables one man to merely *"push buttons"* and actually see on a panelboard whether the valves are open or closed.

Various *LimiTorques* are available for different requirements on all types of valves (globe, gate, butterfly, plug, etc.)—and, too, *LimiTorques* may be supplied for actuation by any power source, such as electricity, steam, water, gas, oil or air.

Thousands of *LimiTorques* are in use throughout the world, on land and sea. Be convinced; send for our 96-page catalog, L-48, and please use your Business Letterhead when requesting it.

LIMITORQUE
CONTROL

Philadelphia Gear Works, INC.

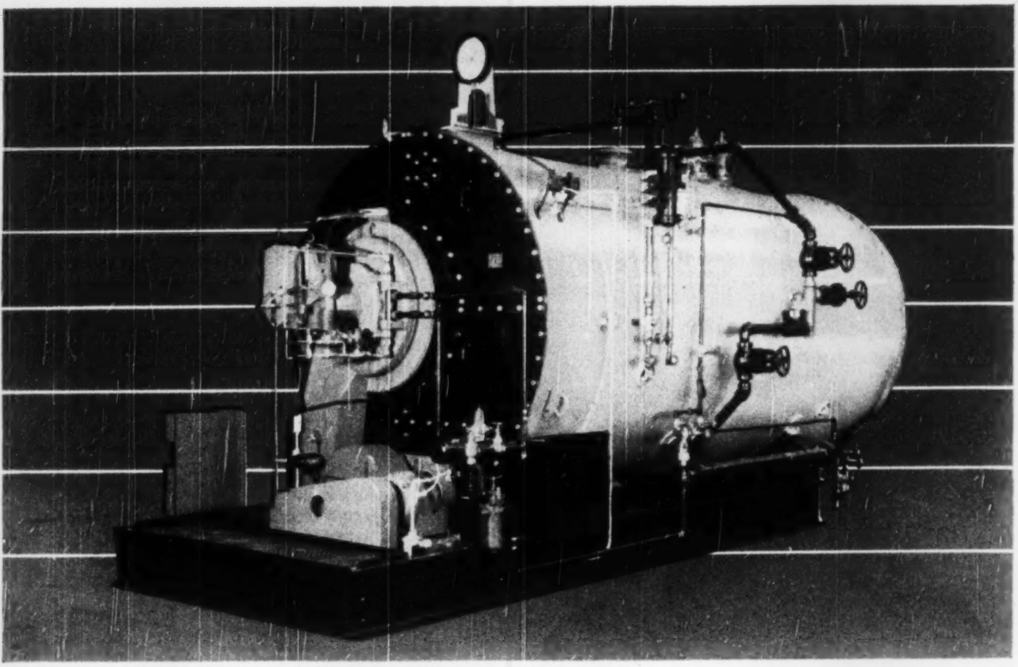


ERIE AVE. AND G ST., PHILADELPHIA 34, PA.
NEW YORK • PITTSBURGH • CHICAGO • HOUSTON
IN CANADA: WILLIAM AND J. G. GREEY LIMITED, TORONTO

Industrial Gears and Speed Reducers
LimiTorque Valve Controls

A NATION-WIDE NETWORK OF FACTORY-AUTHORIZED SERVICE

. . . Another Reason Why You Get A Greater Return From Your Investment In A Cleaver-Brooks Steam Boiler



Nothing is more important than dependable operation of your steam boiler — vital to such operation is proper maintenance and service.

Cleaver-Brooks steam boiler service facilities are national — through factory-trained and authorized service organizations. Service begins with starting of your new boiler. It is placed in operation and fully tested under load by Cleaver-Brooks service-representatives. Your operators are trained in operation, care and maintenance.

Burn the available fuel in your area — gas or oil — with equal efficiency: Through their high heat transfer Cleaver-Brooks boilers operate at a guaranteed efficiency of 80% from full load down to 30% of rating, burning gas, oil, or combination gas and oil. No high or costly stacks (a simple roof vent carries off combustion gases)—no special foundations needed. Fit low head-room areas — provide quick steaming, flexible operation to meet fluctuating loads — eliminate ash handling. Cleaver-Brooks boilers fully meet all codes — available in sizes 15 to 500 H.P. — 15 to 200 P.S.I. Write for new, just published catalog.

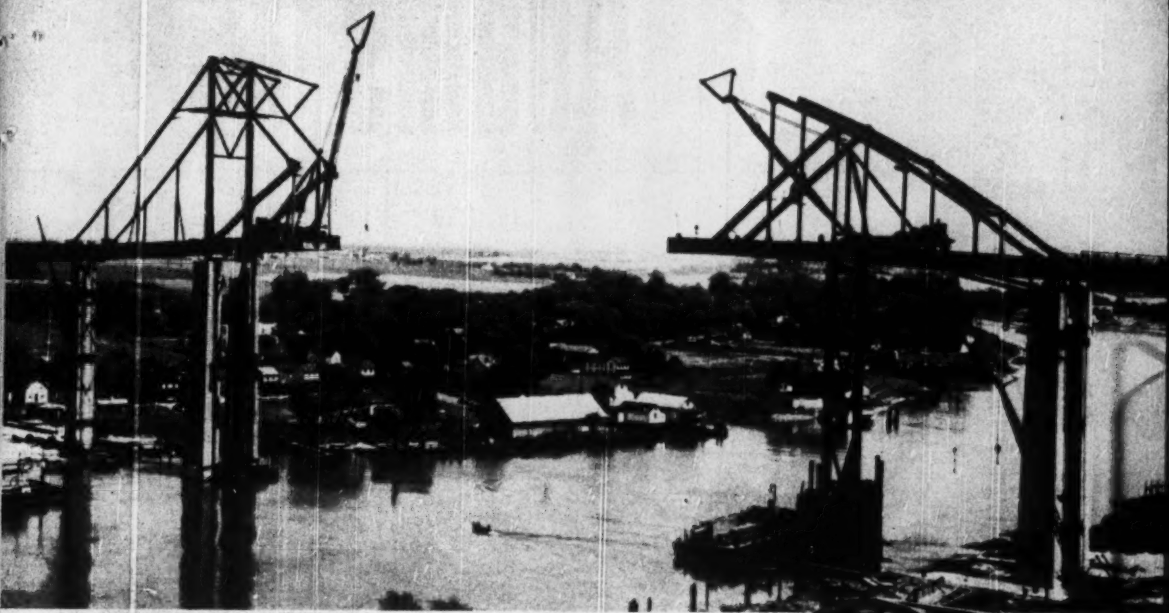
CLEAVER-BROOKS COMPANY
389 East Keefe Avenue, Milwaukee 12, Wisconsin

NEW — *The Cleaver-Brooks steam boiler Catalog—interesting—informative—beautifully illustrated. Write—on your business letterhead for your copy.*

Cleaver-Brooks

STEAM BOILERS

Dual erection methods solve arch construction problem



Erection of arch span, showing falsework and toggle bent. The arch is 93 ft. high, centerline rib to centerline of tie at mid-span, and provides a vertical clearance of 135 ft. at mean high water.

Completed bridge—built for the Philadelphia District of the U.S. Army Engineers—consists of a 540 ft. tied arch span flanked by girder approach spans at both ends. Total length between abutments—3954 ft. Weight of structural steel—5,000 tons. In addition to the fabrication and erection of the superstructure, American Bridge Company furnished the concrete roadway and sidewalk, stairs and electric lighting. Parsons, Brinckerhoff, Hall & Macdonald, Consulting Engineers.

• In erecting the new highway bridge over the Chesapeake and Delaware Canal at Chesapeake City, Md., the problem was to provide a safe channel for navigation during erection. Therefore only one falsework bent could be used. American Bridge engineers solved this difficulty by an unusual combination of erection methods, using a falsework bent at the south side of the canal and a toggle bent over the north pier.

This engineering know-how — this wide experience in successfully meeting special situations on jobs of every size and type—is available to you on your own jobs, large or small, through our nearest Contracting Office.

AMERICAN BRIDGE COMPANY
General Offices: Frick Building, Pittsburgh, Pa.
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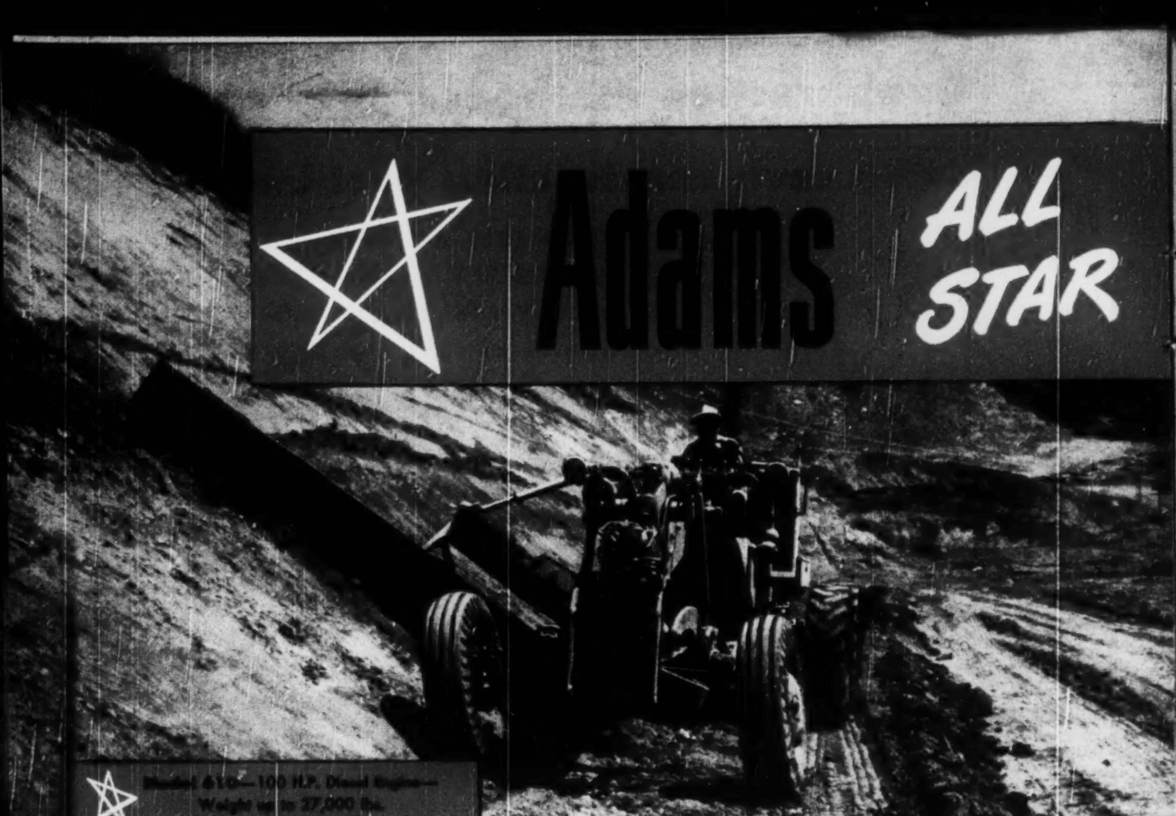
USS

AMERICAN BRIDGE

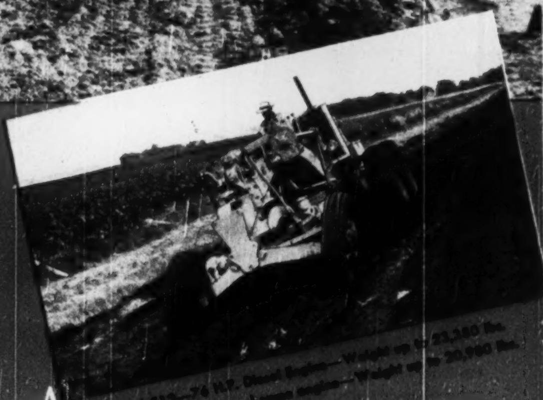
UNITED STATES STEEL

Adams ALL STAR



Model 610—100 H.P. Diesel Engine—
Weight up to 27,000 lbs.

Model [illegible]—100 H.P. Diesel Engine—Weight up to [illegible] lbs.



Model 513—76 H.P. Diesel Engine—Weight up to 23,380 lbs.
Model 414 (not shown) same engine—Weight up to 20,980 lbs.

Model [illegible]—[illegible] H.P. Diesel Engine—Weight up to 19,460 lbs.
Model [illegible] (not shown)—[illegible] H.P. Gas Engine—Wt. up to 19,645 lbs.

Model 301—31 H.P. Gasoline Engine—Weight up to 10,000 lbs.

MOTOR GRADER TEAM

for 1950

For all-around usefulness and economical performance choose your motor graders this year from Adams—the world's most complete line.

From the big extra-heavy-duty Model 610, with 100 H.P. Diesel engine, to the general utility Model 201, with 31 H.P. gasoline engine, all Adams Motor Graders are of the same proved design—all capable of the same wide range of work, in proportion to size and power.

Big operator or small—highway official or contractor—you'll find in the *All-Star* Adams team a machine exactly right for your needs or budget—a machine built to deliver the fastest, most efficient and economical performance you've ever known. See your near-by Adams dealer.

J. D. ADAMS MANUFACTURING COMPANY • INDIANAPOLIS, IND.

Make your next motor grader an **ADAMS**

JENKINS VALVES *installed in New York Union Motor Truck Terminal* for lowest maintenance cost

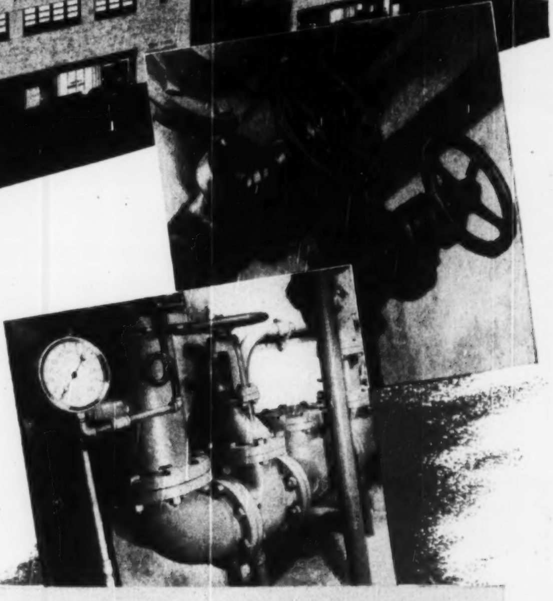
THE PORT OF NEW YORK AUTHORITY

Contractors for the Building

Building:
CAULDWELL-WINGATE CO.

Plumbing:
J. L. MURPHY, INC.

Heating:
BAKER SMITH & CO.



A CONSOLIDATING TERMINAL for interchange of mixed merchandise freight between over-the-road carriers and local city trucks, the New York Union Motor Truck Terminal was established to reduce shipping costs, and to relieve truck traffic congestions.

All equipment used in the terminal, whether for freight handling or building operation, was selected on the basis of *lowest possible maintenance cost.* That is why Jenkins Valves (over 2800) are installed in water, steam, fire, and other vital pipe lines.

Jenkins builds *extra* endurance into valves—proved time and again by low upkeep cost records in every type of service. Yet, *you pay no more* for Jenkins Valves, despite this extra value. Let the Jenkins Diamond be your guide to valve economy . . . for new installations, for all replacements. *Sold through leading Industrial Distributors everywhere.*

Jenkins Bros., 80 White St., New York 13;
Jenkins Bros., Ltd., Montreal

JENKINS

LOOK FOR THE DIAMOND MARK

VALVES

SINCE 1864

REG. U.S. PAT. OFF.

TRADE JENKINS MARK

Jenkins Bros

"We've specified U. S. ROYALS for the toughest hauling jobs!"

says Raymond B. Hamilton, Chairman of the Board,
R. B. Hamilton Contracting Co., Inc., Roslyn, L. I., New York

"...We've found they meet our heavy trucking needs best—at *Lower Cost per Mile!*

We've just received three new trucks and specified U. S. Royal Fleet Delivery Tires. That makes nine of our fleet —90 wheels delivering top service at lower cost per mile. We've found by experience that U. S. Royals stand up under the toughest hauling jobs."

U.S. ROYAL
FLEET DELIVERY

U. S. ROYAL FLEET DELIVERY (Off-the-Road Type). Here's a big, husky tire especially designed for tough jobs:

- Extra tread depth and width mean longer wear.
- Husky shoulder design gives added protection against scuffing and snagging.
- Tread rubber is specially compounded to resist cuts.

U. S. FLEET SERVICE. Your U. S. Royal Distributor is ready to draw up a tailor-made preventive tire maintenance plan designed especially for your operation—a plan which can give you lower cost per tire mile! He'll give you service where it counts—on your job! Call your U. S. Royal Distributor today. He's listed in your Classified Telephone Directory.

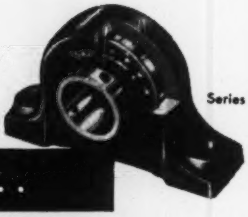
U.S. ROYALS

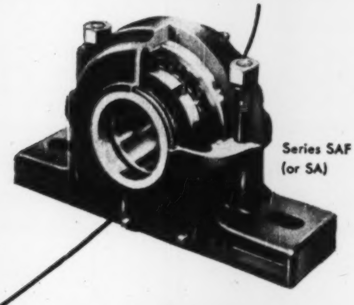
**Products of
UNITED STATES
RUBBER COMPANY**

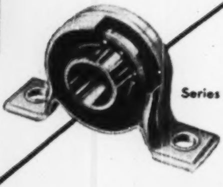
U.S.
ROYAL
TIRES

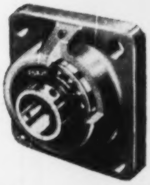
One for every place . . .

and one place to get them all

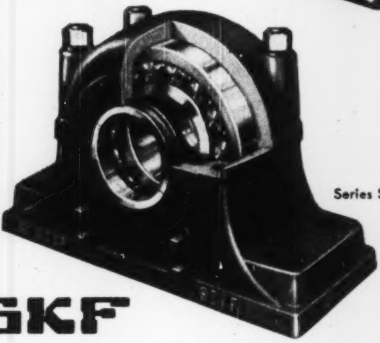








Series SUAR
(or SUA)



**PILLOW BLOCKS
ENGINEERED BY SKF**

Specify pillow blocks and flanged mountings by SKF and you get bearings and housings engineered as a unit. What does this mean to you? It means you get the full benefit of SKF's skill and precision methods of manufacture. It means you're sure of minimum friction and trouble-free, low-cost operation. It means efficient seals that retain lubricant . . . keep out dust and abrasive elements. It means minimum maintenance . . . maximum efficiency.

SKF supplies 5 basic types of pillow blocks for shafts from ½-inch to over 9-inches . . . and 2 basic types of flanged mountings for shafts from ½-inch to 2⁷⁄₁₆-inches. Whether you need Series SES for lightly loaded applications or Series SDAF to withstand unusual shock and heavy thrust loads . . . or any intermediate type . . . there's an SKF pillow block that's exactly right for the job.

Check your SKF Distributor, he has a stock of these pillow blocks and flanged mountings to meet *all* your requirements. *SKF Industries, Inc., Philadelphia 32, Pa.* 7044

8 REASONS WHY SKF IS PREFERRED BY ALL INDUSTRY

INTEGRITY · CRAFTSMANSHIP · METALLURGY · TOLERANCE CONTROL · SURFACE FINISH · PRODUCT UNIFORMITY · ENGINEERING SERVICE · FIELD SERVICE

SKF
PILLOW BLOCKS

*Pioneers of the Deep Groove Ball Bearing—
Spherical Roller Bearing—Self-Aligning Ball Bearing*

HUNDREDS OF HYSTAWAYS IN USE ALL OVER THE WORLD...

it's a DRAGLINE

it's a CRANE

it's a CLAMSHELL

it's a BACK HOE

...and now

THE HYSTAWAY® is also a SHOVEL

HYSTAWAY—5 tools in 1—for mounting on all "Caterpillar" D8 and current series D7 track-type tractors (Dragline, Crane and Clamshell also applicable to D6.) On in 2 hours, off in 1.

And the newest tool in the Hystaway combination—a shovel front—makes Hystaway an even more valuable earthmoving machine.

The Hystaway Shovel Front possesses all of the advantages of a conventional shovel, *plus* full tractor mobility, *plus* an excess of power, *plus* an extremely fast swing, *plus* an unusually long reach.

Hyster's line of 29 tractor tools (including the Hystaway) is sold and serviced by "Caterpillar" distributors everywhere. Current delivery. Write for literature.

½ CU. YARD CAPACITY

HYSTER® COMPANY

2953 N. E. Clackamas, Portland 8, Oregon
1853 North Adams St., Peoria 1, Illinois

FOR SOIL COMPACTION WHERE ROLLERS *CAN'T GO!*

The Barco Pegson Rammer

This self-contained, portable rammer is specially adaptable to tamping close to abutments and other wall structures, in narrow ditches and trenches, thus eliminating troublesome settlement areas. Actual field tests, certified by Government agencies, have proved that one man using the Barco can do *the work of five* who use conventional equipment! This economical machine is easy to operate—no lifting, no strain, no vibration. A slight tilt on the handle will "walk" the Barco wherever you want it to go. Don't tie up your funds in heavy equipment—order Barco today. Write for free demonstration or catalog to Barco Manufacturing Co., 1814D, Winnemac Avenue, Chicago 40, Ill.

BARCO *Gasoline Rammer*

In Canada: THE HOLDEN CO., LTD., MONTREAL, CANADA

FREE ENTERPRISE . . . THE CORNERSTONE OF AMERICAN PROSPERITY

RUSH!

43,000 FT. INSULATED PIPING SYSTEM...

Loading 21-foot sections of Ric-Wil Hel-cor straight units on an air freight plane for direct air shipment from Akron, Ohio to destination.

To meet the rigid construction and installation schedule set up by field engineers on a recent development, Ric-Wil coordinated shipments of material with the schedule by utilizing air freight. Such coordinated planning and production resulted in a great time saving in the project schedule.

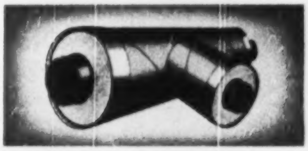
This unique air shipment is an example of the careful planning and scheduling of the Ric-Wil engineering and production organization to supply customer requirements.

The proven performance and efficiency of Ric-Wil Insulated Piping Systems is backed by forty years of development, engineering, and production experience.

Prefabricated–

FOR QUICK INSTALLATION

Prefabricated Ric-Wil Elbow Section



Prefabricated Ric-Wil Tee Section

For full technical information on Ric-Wil Systems call or write the Ric-Wil office nearest you or Dept. 10-G in Cleveland, Ohio.

Ric-Wil

INSULATED PIPING SYSTEMS

THE RIC-WIL COMPANY • CLEVELAND, O.

OVERHEAD **UNDERGROUND**

FOR FORTY YEARS THE GREATEST NAME IN INSULATED PIPING SYSTEMS

"C" TOURNAPULL.
gives you year-round PROFITS

LeTOURNEAU
TOURNAPULL
C ROADSTER

No other dirtmover can offer you the opportunities for steady earnings that come to you with C Tournapull. Behind this high-speed, rubber-tired prime mover you can interchange at will six different types of money-making equipment to fit the times, the season, and your own profit opportunities. Each fits specific needs for earning extra profits on your own jobs, for good pay on subcontracts, or for high-rate rentals.

Note that each of these auxiliary interchangeable units is a simple, rugged, specialized tool for doing certain types of work at a far lower cost than is customary with general purpose equipment. When you buy any one combination with the C Tournapull prime mover you get with it an extra value in insurance of steady and profitable earnings, because of its great versatility of application with other hauled units.

C Tournapull prime mover . . . 190 h.p. diesel . . . 5 speeds to 30 m.p.h. . . . 21.00 x 25 low-pressure tires . . . power steer, 90° turns . . . electric controls . . . uses 4-wheel multi-disc air brakes, braking surface 4,176 sq. in.

Tournapull, Tournacrane, Tournamixer- Trademark Reg. U. S. Pat. Off. Tournarocker, Tournahopper-Trademark C127

To: R. G. LeTOURNEAU, INC., Peoria, Illinois

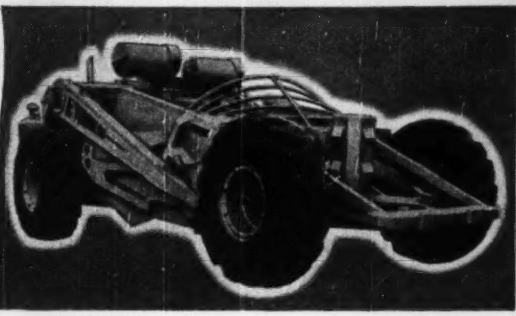
Please send information on C Tournapull prime mover for work with:

☐ Scraper ☐ Rear-dump hauler ☐ Bottom-dump hauler ☐ Flat bed ☐ Crane ☐ Concrete Mixer

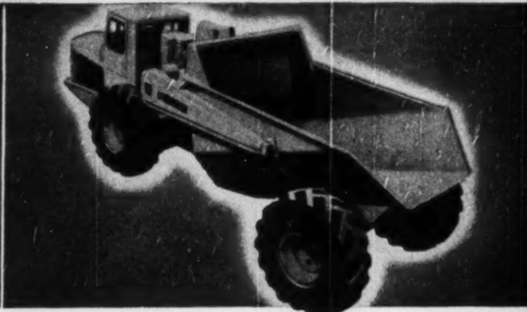
NAME.. TITLE..................................
COMPANY.. TYPE OF BUSINESS.....................
STREET.......................... CITY, STATE...

If you have work to subcontract for any of tools shown, please describe fully in letter and we will have your local LeTourneau Distributor put you in touch with nearest owner equipped to handle your work.

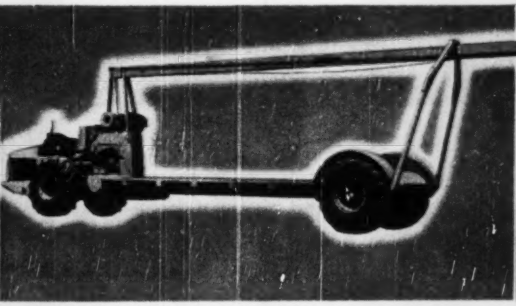
.interchangeability



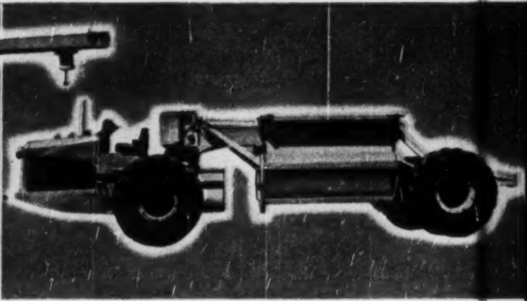
TOURNAPULL . . . C Roadster loads 13.5 cubic yards (capacity 16 tons). In any kind of scraper dirt on either long or short hauls, will beat all previous LeTourneau Scrapers in this size range for both output-per-day and cost-per-yard. Optional hauled units, bought as needed, cost $4500 to $7400, prime mover change takes only a few hours.



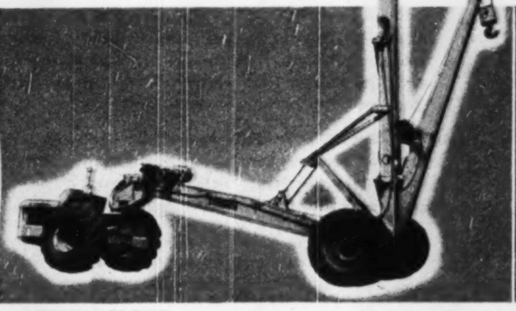
TOURNAROCKER . . . a revolutionary new rear-dump haul unit for use under shovel, dragline, conveyor or other loading equipment. Capacity 16 tons or 16.5 yards heaped. Big shovel target, 7' 10½" x 11' 2" . . . 15' 11" wheelbase. Simple electric body hoist. Dumps clear over bank, tips vertical to clean fast. Turning radius 90° or 12½'.



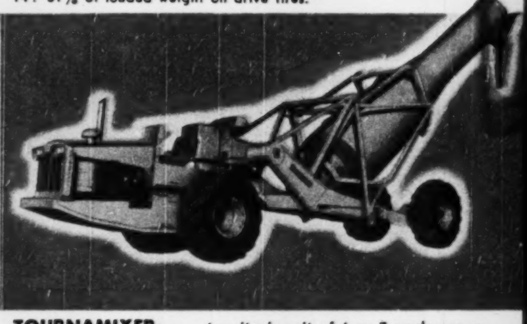
TOURNAHAULER . . . 20-ton flat-bed can take heavy construction, oil field, logging, and mining equipment and supplies on or off highways or cross country. Traveling overhead monorail car with 5, 10 or 15-ton electric hoist optional — one-man operated from the ground by remote control or from the cab. One hauling contract often pays for entire cost of hauler.



TOURNAHOPPER . . . bottom-dump hauler . . . 15-yards heaped, 16-ton capacity. Tournamatic differential, giant tires, and high clearance take it through muck and gumbo. Easy loading . . . top opening 8' x 8'. Easy to drive over windrows, clamshell-type dump-doors lift clear, give 22" clearance open. Turn radius 14'. 51% of loaded weight on drive tires.



TOURNACRANE . . . capacity, 15 tons with full maneuverability and travel with maximum loading. Maximum lift 35', reach 35'. Sliding boom on tilting track gives unique load maneuverability for structural repair and erection. Individual electric motors control each function independently. Reaches into "impossible" places . . . goes anywhere through sand, mud or gumbo.



TOURNAMIXER . . . transit-mix unit of 6 or 7 yards capacity ready to go anywhere on or off highway. Mixing speed 7 to 10 r.p.m. Two discharge speeds — 7 to 20 r.p.m. No need for chutes or elevators, Tournamixer dumps directly into forms at horizontal distance of 10' 7" back of wheels or at elevations from 4' 10" to 20' 8". All electric control from driver's seat.

LETOURNEAU PEORIA, ILLINOIS

JOB-PROVED Over 6,300 Built and Shipped

TOURNAPULLS

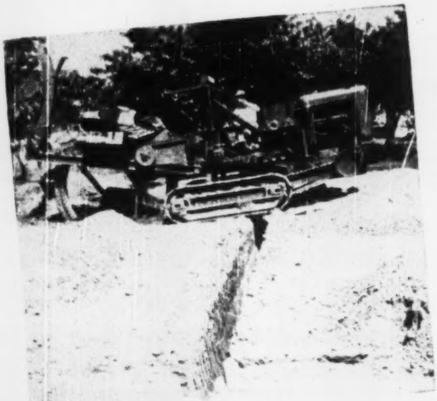
MORE YARDS PER HOUR WITH RUBBER-TIRED POWER

CLEVELAND
3
CLEVELAND

®

CLEVELAND TRENCHERS

Cut Costs 4 Ways!



1 CLEVELANDS set a fast pace out in front on your jobs, helping you stay on schedule. Their speed, easy handling and plenty of smooth power give you top yardage when time is pressing.

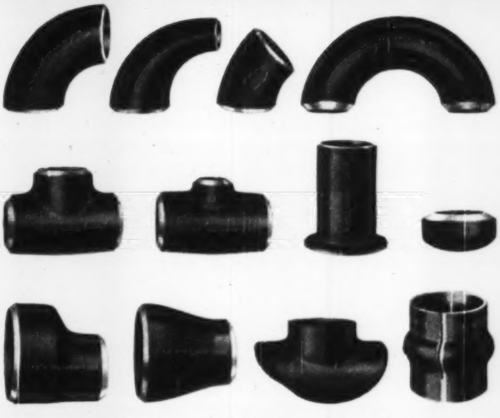
2 CLEVELANDS are built rugged, built with extra stamina for long continuous performance under the most punishing field conditions, built to need less attention and cut maintenance costs.

3 CLEVELANDS superior flexibility and the speedy way they move from job to job mean you can use each machine on more jobs and on more different kinds of jobs than ever before.

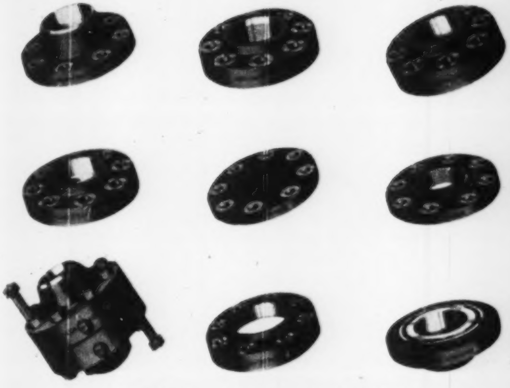
4 CLEVELANDS give you new low fuel and operating expense.

Learn today how CLEVELANDS can pay off for you. See your local distributor or write direct.

THE CLEVELAND TRENCHER COMPANY
20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO



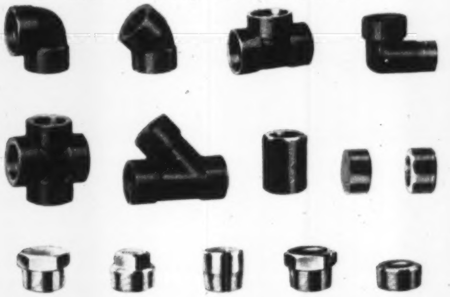
SEAMLESS WELDING FITTINGS
½-inch through 36 inches
Standard through Double Extra Strong



FORGED STEEL FLANGES
½-inch through 30 inches
150 lbs. through 2500 lbs. pressure

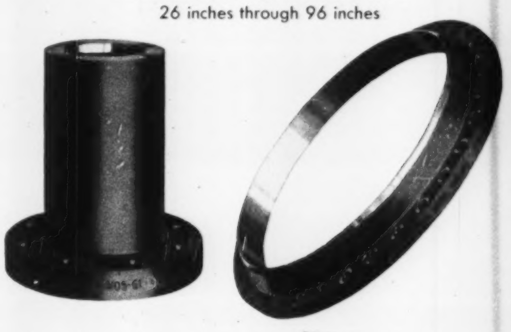
TO MARK PROGRESS

FORGED STEEL FITTINGS
Screwed and Socket Welding
⅛-inch through 4 inches
2000 lbs. through 6000 lbs. pressure



LONG WELDING NECKS
1-inch through 24 inches

LARGE O.D. FLANGES
26 inches through 96 inches



Ladish... one place to get them all

Available in
CARBON
ALLOY
STAINLESS STEELS
ALUMINUM
COPPER
and OTHER
NON-FERROUS
METALS

Whatever the piping job . . . Ladish is prepared to supply your fittings needs. Here is the one line that offers them all . . . Seamless Welding Fittings, Forged Steel Flanges, Forged Steel Fittings, Large O. D. Flanges and Long Welding Necks . . . in an unrestricted selection of types, sizes, weights, pressure ratings and materials. Standardizing on this complete line not only simplifies procurement but also assures you of added dependability by protecting every joint of the system through use of Ladish Controlled Quality Fittings.

A COMPLETE LINE PRODUCED UNDER ONE ROOF
. . . ONE RESPONSIBILITY

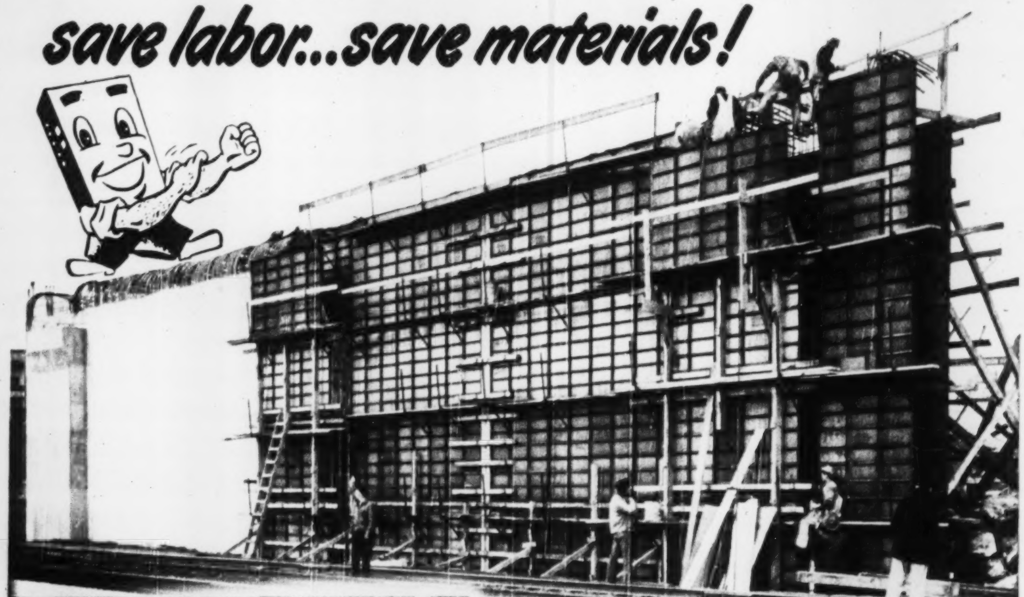
LADISH CO.

CUDAHY, WISCONSIN
MILWAUKEE SUBURB

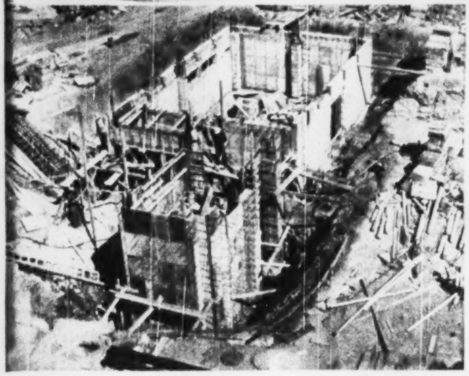
DISTRICT OFFICES: New York • Buffalo • Pittsburgh • Philadelphia • Cleveland
Chicago • St. Paul • St. Louis • Atlanta • Houston • Los Angeles

UNI·FORMS form BIG *areas faster...*

save labor...save materials!

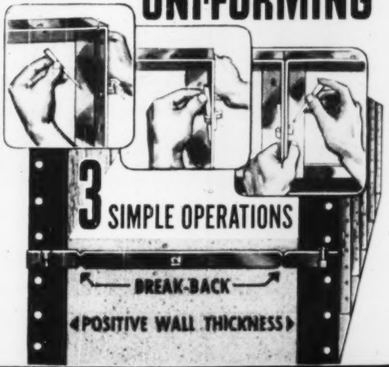


LINED AND BRACED ON 1 SIDE . . . LEAVES UNOBSTRUCTED WORKING AREA ON OTHER SIDE.



VERSATILITY—EVERY CONCEIVABLE WALL DETAIL . . . UNI-FORMED

UNI·FORMING



Faster erection . . . automatically accurate wall widths . . minimum 1 side alignment and easy adaptability to any forming requirement makes UNI-FORMING the most economical method of forming any type of concrete.

You can form bigger areas, using less man hours and materials with UNI-FORMS . . . steel-framed UNI-FORMS comprise a tight, rigid form that requires no additional structural members.

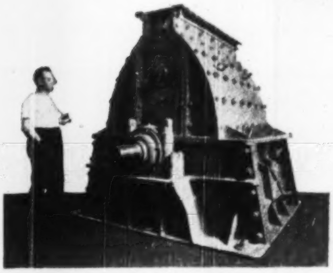
Let us prove our point. Send a set of plans for an estimate of your UNI-FORMING costs. There is no obligation.

WRITE FOR THE NEW UNI-FORM CATALOG

UNIVERSAL
Form Clamp Company
FOUNDED 1912
1238 N. KOSTNER • CHICAGO 51, ILL.

65 YEARS OF CRUSHER ENGINEERING TO GIVE YOU ON THE JOB RELIABILITY

Production goes up— Costs go down!

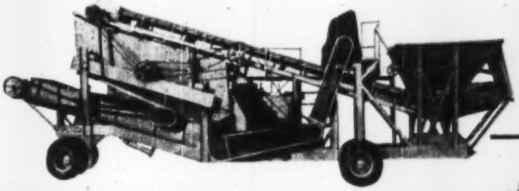


Gruendler Center-Feed Impact Pulverizers

Producing Stone Sand to meet new specifications of homogenous aggregates.

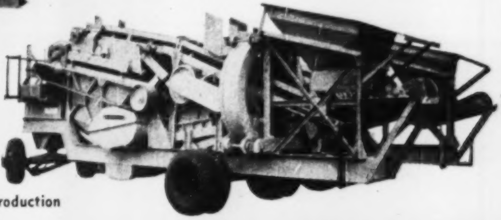
GRUENDLER gives you Larger Capacities for more output per man hour.

Heavier built, powerful—Rock, Gravel Stone—Sand producing units, singly—in combination—stationary or mobile, provide the flexibility of operation at the lowest possible machine investment, with maintenance cut to the bone.



Gruendler mobile gravel and sand—screening, washing plant—

Produces three or four simultaneous products, including sand.

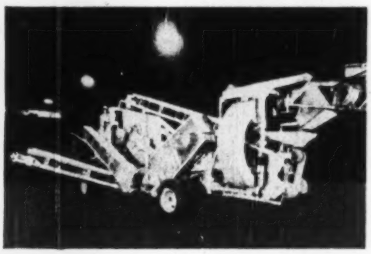


Gruendler Combination Rock-Gravel Crushing and Screening Plant.

Combines primary Jaw Crusher and Secondary Roll Crusher—Screen. Here you have a complete aggregate factory on wheels.

Important! . . .

Recommended Plant Layouts with equipment estimates and production costs furnished on written request.

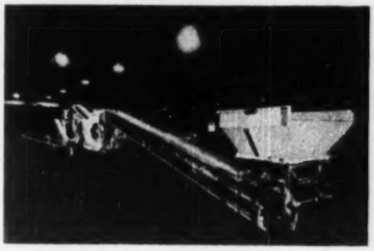


Modern Plant Facilities

to assure you PROMPT DELIVERY!

Shown here, . . .

Gruendler plants assembled and tested before shipment.



GRUENDLER

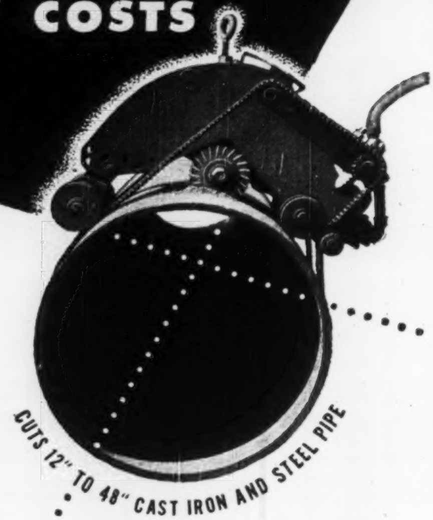
CRUSHER AND PULVERIZER CO.

Plant and Executive Offices **2915-17-19-21 N. Market, St. Louis 6, Mo.**

Note: Overnight part service anywhere in the country

WACHS NATIONAL PIPE SAW

CUTS PIPE CUTTING COSTS



TIME AND COST CUTTING FEATURES

- Minimum Pipe Line down time.
- Cuts under water in flooded ditches.
- No broken pipe, milled cut.
- Thor Air-Powered, no flames near pipe.
- Set-up time about 15 minutes.
- Portable — weighs only 265 lbs. Two men can carry and set up unit.
- Small excavation — only 14" clearance needed in ditch.
- One machine cuts all pipe sizes from 12" to 48".
- Only two adjustments necessary for size changes.

The Wachs National Pipe Saw is actually an air powered milling cutter that travels around the pipe on two silent type chains which act as a flexible ring gear, assuring positive feed and compensating for pipe bulges. This fast, accurate, labor saving saw makes the complete milled cut in one revolution at a travel rate of 2" per minute.

Write today for descriptive folder and engineering data on this new labor saving saw.

THE E. H. WACHS COMPANY

Manufacturers of Engines, Valves and Machinery since 1883

1525 NORTH DAYTON STREET · CHICAGO 22, ILLINOIS

35 Years' Experience

GUNITE CONSTRUCTION

Bridges, stacks, bunkers, pipe lining, steel encasement, repairs to disintegrated masonry, etc.

WE SPECIALIZE IN DAM REPAIRS

WHITE & McCOLL, INC.

75 WEST STREET
NEW YORK 6, N. Y.
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MOVING, RAISING, HEAVY SHORING, UNDERPINNING

National Operations

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Registered Engineers

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Established 1886

NEWS BRIEFS

Rain First, Lawsuits Later—Salt River Valley Water Users' Association in central Arizona has decided to let lawsuits fall where they will if they can only get the rain to fall. Faced with the prospect for the second-lowest winter run-off in 36 years, the association has contracted with Precipitation Control, Inc., to supply two cloud-seeding aircraft for use through the summer, supplementing three ground installations, all aimed at inducing rain.

Never Satisfied—Trucks and other motor vehicles whose drivers don't want to pay toll on Boston's new Mystic River Bridge are creating traffic jams on by-pass routes. So Mayor P. J. Crowley, of Everett, has asked Massachusetts to build an underpass on Broadway, below the Revere Beach Parkway, to ease the tangles.

Stitch-in-Time Dept.—St. Louis' Board of Freeholders has adopted for inclusion in the new city charter a requirement that all plans for buildings or alterations to them be inspected by the Fire Department before issuance of a permit. Under present rules, some builders complete their work, then call for fire department inspection, thereby pressuring the department into accepting work it might not if it had seen the plans before construction.

Needed: One Law—Idaho's proposal to create a pollution control board depends on acceptance of a constitutional amendment which goes to the voters this fall. It would have to be ok'd next year by the legislature, also. The Health Department can't now require waste disposal.

Music Goes 'Round and Around—Brig. Gen. S. D. Sturgis, Jr., has rejected the assertion of Leslie A. Miller that there isn't enough water in the Missouri River for all authorized Pick-Sloan projects, but that doesn't end the argument about Big Muddy's development. Now, a group of conservationists who don't like the Pick-Sloan program are organizing the Associated Missouri Basin Conservationists. Miller will be a speaker at the organization meeting. The new group says the big dams under construction are economically unsound.

Milwaukee Looks Ahead—A metropolitan transit authority, city-built, off-street parking, expressway develop-

(*Continued on page 69*)

STOP ON THE JOB BLACKOUTS

New, Heavy-Duty, Vibration-Proof

CONTRACTOR'S FLOODLIGHT

Here is the floodlight that will prevent those costly on-the-job blackouts. Designed for heavy duty lighting on shovels, draglines, trenching machines and other equipment. Custom built and field tested to give trouble-free performance under the most severe working conditions.

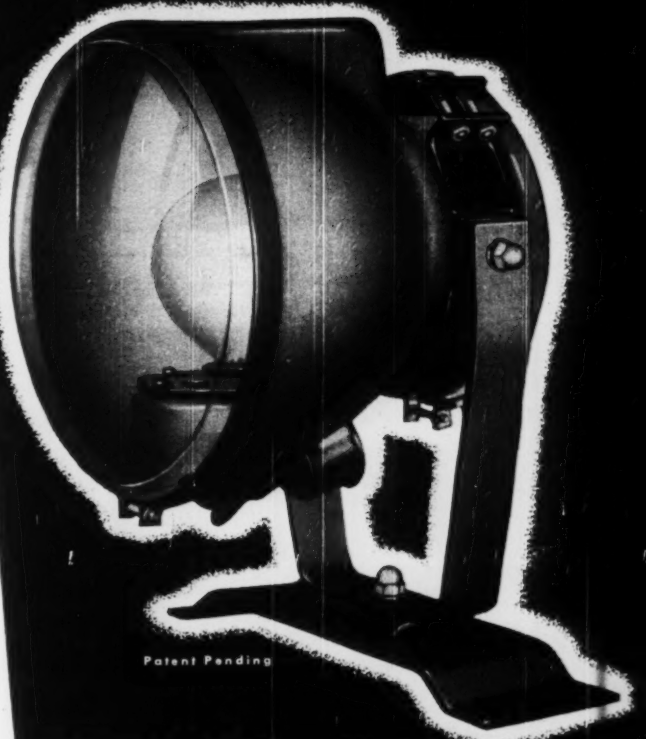
This versatile floodlight can be mounted in any position and adjusts readily to any focus from spot to full flood.

CHECK THESE FEATURES FOUND ONLY IN THIS FLOODLIGHT:

- One piece, cast aluminum casing.
- 16 gauge, heavily chrome-plated copper reflector. Adjusts from spot to full flood.
- Heavy duty, heat-resisting Pyrex lens.
- Standard 3/16" stove bolts are used to hold lens ring and back clamping plate.
- Bulb is mounted in a vertical position in a rubber diaphragm, and is cooled by a continuous stream of cold air passing through the diaphragm, over the bulb and out a water-proof air vent in the top of the casing.
- Lighting cord is attached to light with a Hubbel quick-twist lock connector.
- Full universal mounting permits traversing, elevating and depressing through 360°.
- Heavy steel base and universal mounting bracket.
- Casing opens from back, making bulb changing easy, with less chance of breakage.

Distributors: Several desirable territories available—write us.

CONTRACTOR'S
FLOODLIGHT MFG. CO.
30425 FORD ROAD
GARDEN CITY, MICHIGAN



Patent Pending

250 or 400 Watt Model

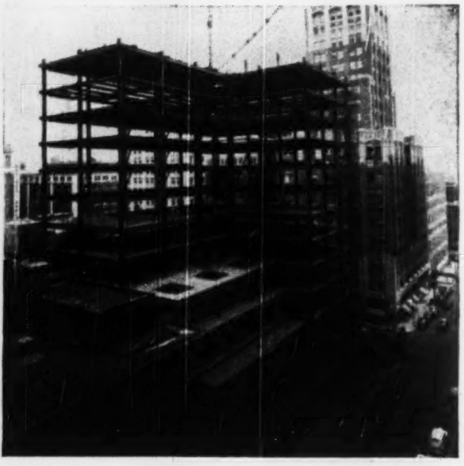
Other Models for Cab or Boom Mountings
250 to 1000 Watts

Write for information on all models

CONTRACTOR'S FLOODLIGHT MFG. CO.
30425 Ford Road, Garden City, Michigan

Please send me complete information on all models of Contractor's Floodlights (250 to 1000 watts)

Name ________________
Company ________________
Title ________________
Address ________________
City ________________ *State* ________________



This is the clean, uncluttered job site and working areas characteristic of Q-Floor construction . . . at the First National Bank of Tulsa, Oklahoma. Carson and Lundin, New York, architects.

Hangers for suspended ceiling and mechanical equipment require no pre-set inserts. Mechanical and electrical layouts can be changed without difficulty during construction.

Location of electrical and telephone outlets can wait until building is completed. They can be moved to new locations with no dirt or mess . . . quickly and inexpensively.

ROBERTSON Q-FLOOR
CUTS COST
all along the line . . .

for the CONTRACTOR

The cellular-steel sub-floor construction provided by Robertson Q-Floor results in immediate benefits to the general and sub-contractors. The minute that Q-Floor units are laid in place they become a working platform for all trades, their equipment and materials. This means a clean job site, with streets uncluttered, and a safer job for workmen throughout. There is no waiting for wet materials to set, no time wasted during freezing weather, and no danger of construction fires. The entire job is speeded, requiring a shorter construction financing period. Everything adds up to *lower costs.*

for the ARCHITECT AND ENGINEER

Q-Floor construction reduces costs and headaches for the architect and engineer by cutting out non-productive drafting room time making the innumerable changes that are bound to come up. With Q-Floor no pre-set inserts are required for the hanging of ceilings and mechanical equipment. Changes can be taken in stride. Electrical, telephone desk and partition layout need not be definitely pinned down until the last moment . . . Q-Floor construction *cuts costs* because it affords complete flexibility of layout.

for the OWNER and TENANT

The owner benefits because, first, Q-Floor construction is light-weight . . . reducing expensive dead load throughout the building. Second, Q-Floor construction is fast. The building is finished sooner and the owner begins to get a return on his investment sooner. Third, Q-Floor will guarantee his building against electrical obsolescence and the threat of lower rent return over the years. The tenant benefits because the changes to office layout (which he always must pay for) are reduced. He can have the office he wants, and change it at will, at a tremendous *savings in cost.*

WRITE FOR COMPLETE DETAILS

H. H. ROBERTSON CO.

2490 Farmers Bank Building
Pittsburgh 22, Pennsylvania

ment and public housing expansion are among the planks of a public works platform for Milwaukee's next two years. The platform was drawn by the Public Enterprise Committee at the request of Mayor Zeidler, who says a new plan is needed.

Bad Guess—Los Angeles County officials are finding the friends of smog control among those they thought would be its foremost opponents—industrialists. Gordon P. Larson, who directs air pollution control for the county, says industrial cooperation is such that industry will be almost completely "desmogged" within a few years.

Busy Bond Market—North Carolina will market its second issue of rural road bonds this week. This block will total \$75,000,000. An earlier issue of \$50,000,000 has been sold under the \$200 million program.

Congress, Please Copy—Massachusetts' Turnpike Commission has turned back \$120,000 to the state treasury. It took the group only \$20,000 of its \$150,000 appropriation to determine that the proposed \$60,000,000 toll highway across the state from New Hampshire to Connecticut is "economically unsound and financially unwise."

Second Chance for Bidders—Los Angeles' Recreation and Park Commission will try again on that underground garage for which it drew no bids at an opening Jan. 27. Next opening for the four-level structure beneath Pershing Square in the downtown area will be held May 25. Since the first opening, four groups have asked permission to submit offers.

Anyone Want a Subway?—Rochester, N. Y., has put consulting engineers to work on a survey of its subway and transit tangle. The Rochester Transit Corp., has notified the city it will discontinue subway service March 31 unless it is assured of adequate financial return.

When is a Law?—Ohio's Supreme Court must rule on the validity of large bond issues approved last November by Cincinnati and Cleveland voters. The question: Whether the issues require approval of 61 percent of the voters or only 55 percent. The latter figure was stipulated in a new law which went into effect only a few days before the elections.

No Construction Slump There—Reclamation Bureau plans for Missouri Basin spending call for more than twice the expenditures in 1955 as are scheduled for the fiscal year beginning next July 1. The Bureau will be building in the basin at the rate of \$221 million yearly in 1955, according to its schedule.

Better Than Being Slugged—Partisans in Missouri's increasingly bitter April 4 referendum on a 4-cent gasoline tax increase charge that bus and truck lines and oil companies are being "slugged" for funds with which to beat the increase.

Relax, Diogenes—Winnetka, Ill., has turned down a federal offer of a new \$316,000 post office building. Village officials said the government has been spending too much money and that a new post office would be extravagant.

Watch That Floor!—It was safer to work for the Pennsylvania Highway Department on a maintenance crew fixing Philadelphia streets last year than in the agency's Harrisburg office building. Crews maintaining the 150 mi of state highway in Philadelphia had no accidents last year, have had no lost-time accidents in a decade. But slippery floors and treacherous armchairs prevent the Harrisburg office from coming close to that record.

Fish Gotta Swim—Director Alvin

When you're selling lollipops the longer they last the more you Sell!

When you're in the concrete business... the Durability of your work "gets around"...

Businesses are built on reputation. Protex Air-Entraining Agent will give you a better reputation for fine concrete because it gives you over 700% more durability, eliminates scaling, cracking, spalling, alkali attack. Protex Concrete resists freezing and thawing... gives a smoother surface texture. Protex AEA "ball bearings" of air literally roll the concrete into place. Protex cuts cost, increases profits... yet it costs you less than 1c per sack of cement! Write today for prices and illustrated folders!

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Anderson, of the Washington Department of Fisheries, says plans to build Ice Harbor Dam, first of four authorized for Army construction on the Snake River above its confluence with the Columbia, are "an absolute breach of faith to the preservation of up-river salmon runs. . ." He said 75 percent of the salmon passing Bonneville Dam enter the Snake watershed, and that Ice Harbor would block it completely and forever.

2,000 More for New York—Plans for a 2,000-apartment federal public housing project in the Bronx have been approved by New York City's Board of Estimate. Named the Edenwald Houses, the project will have three and six-story buildings covering about one-fifth of the 48-acre site.

Stands on Road Record—Arkansas' Governor McMath says the state will complete 80 new road projects this year, at a cost of $18,803,890. His statement provoked speculation that he'll push highway work hard through the time for the primary election, and run on his road record if opposed.

Big BC. Building Budget—Appropriations for construction this year which have been approved by the British Columbia government total $18,000,000. Largest item is $6,500,000 for highways and ordinary bridges, with $5,000,000 more for low-cost housing and another $2,500,000 for steel and concrete bridges. There's $2,500,000 for University of British Columbia buildings and $1,500,000 for some work on the Trans-Canada highway.

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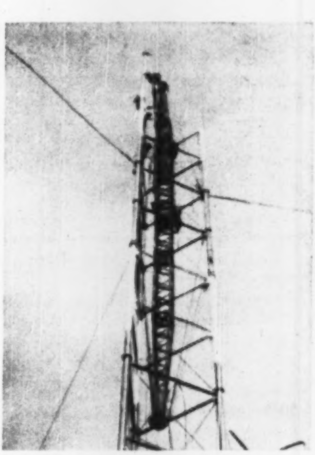
Bad Weather Work—Ashtabula, Ohio's, city council adopted a report proposing that the city's division of public works obtain forms and steam-curing equipment to make concrete pipe for a storm drainage project. It was suggested the city's forces could be kept busy during bad weather by making the pipe for a pending job and others to come. The pending job is estimated to be a $11,000 project, of which the city's share is $7,500.

Mass Production—Oklahoma has a major bridge-building job on its hands. Its highway system, according to Director H. E. Bailey, has 1,051 substandard bridges, replacement of which will cost more than $59,000,000. Bailey said the bridges were built by counties and were thrust under state jurisdiction "chiefly through pressure groups who drove through a transaction that has proved a very poor bargain for the state."



TALLEST TV TOWER—International Derrick and Equipment Co., Columbus, O., is erecting a radio and television tower for Station WCON, Atlanta, that will be 1,000 ft high, exclusive of its 57-ft antenna. An eight-man crew hoists 28-ft leg sections with a three-drum power winch and a revolving gin pole (shown here.) The triangular structure has 14-ft wide sides at its base. They taper to 8.5 ft at the top. It's braced by two guy wires on each side.

IN TEXAS. Tom Popplewell, president of the Panhandle Gravel Co. at Amarillo, reports this Pioneer plant produces 150 yards of sized, washed material an hour. Pioneer equipment—15″ x 36″ Jaw Crusher, 40″ x 22″ Roll Crusher, 4′ x 12′ Vibrating Screen, 48″ Revolving Screen, 30″ Feeder and Conveyors.

IN CALIFORNIA. Carder Livingston, general manager of Livingston Truck and Materials Co., San Pedro, California, reports this Pioneer plant produces 300 tons of 1″ minus granite per hour. Pioneer equipment—30″ x 42″ Jaw Crusher, 54″ x 24″ Roll Crusher, 40″ x 22″ Roll Crusher and Vibrating Screens.

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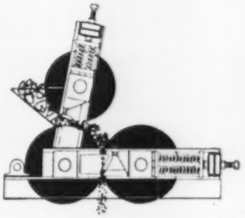

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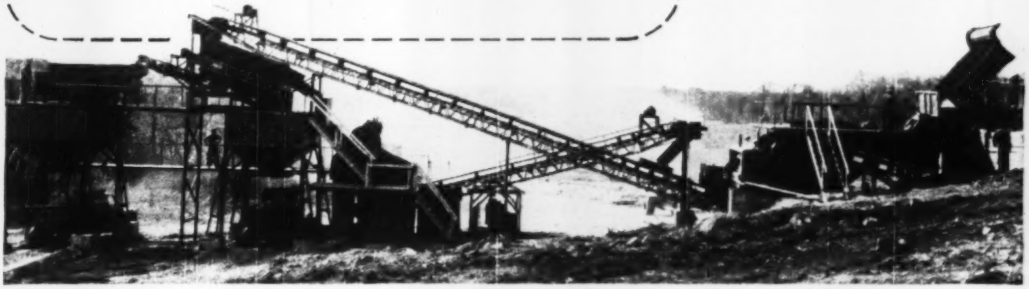

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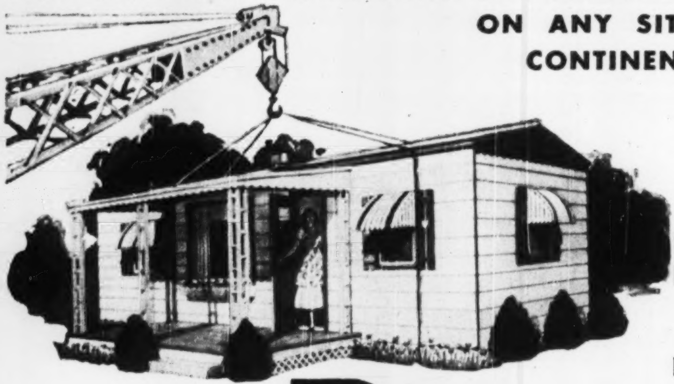

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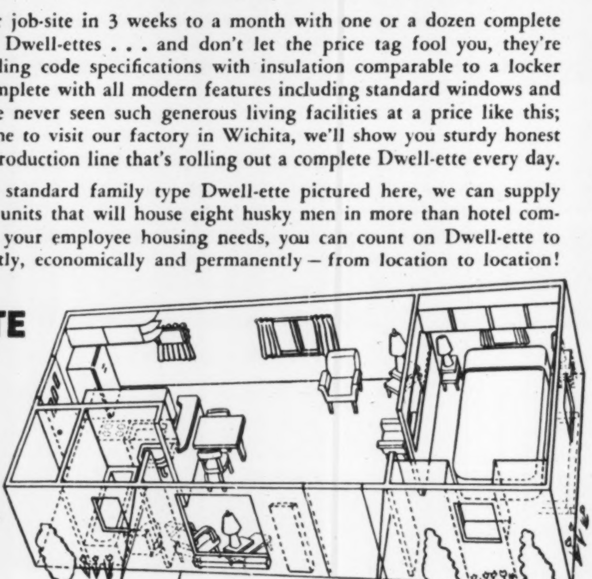

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THE CONSTRUCTION WEEK

YOU'RE RIGHT, BUT—To the general run of criticism on its more cosmic problems, the United Nation's last week added one of more conventional proportions. The UN, said the London TIMES' Washington correspondent, has completely ignored foreign contractors and suppliers in awarding $42,000,000 of construction contracts for its N. Y. headquarters. U. S. labor unions and their restrictive practices—as well as "a certain provincialism" are the reasons, opined the TIMES. True—as to most of the facts—said the UN's builders; not so as to reasons. First consideration was speed and economy in construction, and so only contractors experienced in building in the New York area were considered. Construction materials are not wholly limited to U. S. products: Italian marble, Canadian lumber, wood panelling from the Belgian Congo will be among the materials included in the structures.

DILEMMA—Neither President Truman nor the Interior Department will be too much disappointed if the House fails to pass the Central Arizona bill (ENR March 2, p 25). Should Congress hand the bill to Truman, he will have a thorny decision to make: Should it be signed, in hopes of getting a court settlement of Colorado River water rights? Or should it be vetoed because the measure declares water policies that are now under study by the President's own commission?

CCC AGAIN?—To help relieve the unemployment problem (now climbing into the important class with an estimated 5,000,000 jobless), Sen. James E. Murray and ten of his colleagues have sponsored a bill to revive the Civilian Conservation Corps. Supporters include Rep. Reva Beck Bosone, of Utah, who thinks such a revival would give useful employment to 1,000,000 young men between the ages of 18 and 24.

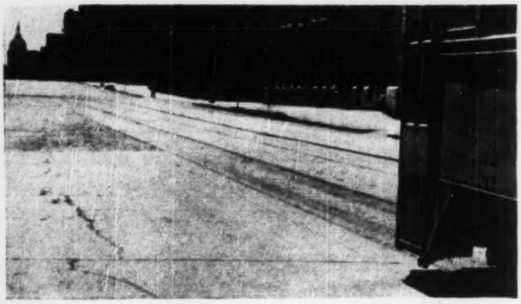
RIVER COOLING—One answer to New York's current water shortage—as well as to certain design problems—has been found in plans to use water from the East River for cooling in the new UN buildings. Corrosion resistant pipes (to carry the salt water of the stream) and elaborate cleaning equipment will be installed. The New York Steam Co., which has been considering a plan to pipe chilled water for cooling purposes to Manhattan office buildings, has dropped the idea as too expensive.

HOW TO ACCOUNT—The problem of accounting methods for power and irrigation projects in the Columbia River Basin comes down to this: The U. S. Budget Bureau's plan would pool all project revenues (ENR Feb. 9, p 25). Opponents claim that this procedure would make it impossible to tell whether any single project is paying off—economical projects would carry the unsound ones. The argument over accounting is of long standing—it started even before power from Bonneville and Grand Coulee dams was delivered over the same grid. At that point, opponents argued that Bonneville's generation being cheaper, it would make the more expensive Coulee power look better than it actually is. In one form or another, the power accounting argument has raged for years.

FOR FREE—Nello L. Teer, Durham contractor who recently sued (and lost to) the North Carolina Highway Commission over the manner in which it is spending $200 million on rural roads (ENR Nov. 17, 1949, p 24), recently completed building 3.3 miles of state roads at no cost to the state. His crews graded, grubbed and drained the roads in just 10 days, despite rainy weather. Since the state was short of engineers, Teer also did the necessary engineering work. Said Teer: The project served as a proving ground for new equipment and for equipment just repaired; as long as the equipment had to be tested, it was better to do so on a useful project. Said the state: "It was a very nice gesture, and we certainly appreciate it."

RECLAMATION AMENDMENT—The sharply modified bill to amend reclamation law (ENR Feb. 23, p 27) is meeting resistance in the House Rules committee. The measure would make flood control and navigation facilities and fish and wild-life propagation works the only non-reimbursable features of reclamation projects; would also authorize the Bureau of Reclamation to furnish recreational facilities at reservoirs it controls. Observers think the chances for passage this session are dimming—despite earlier predictions of easy sailing.

NOT THEREFORE—U. S. Naval planners hit on another economy device recently, that will save space, time, paper (and money). The device is simple: The Navy will eliminate "now therefore" and "whereas" from its contracts. It works, too. A Navy news release said that the Bureau of Yards and Docks placed emphasis on a quick, easily-filled-in contract, cut one 13-page form to one page; chopped payment and performance bond agreements to one additional page from six.



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Both sections, subjected to the severity of ten Minneapolis winters and to heavy applications of de-icing salts, are shown just as they appeared in July, 1949—convincing proof of the characteristic durability of Duraplastic concrete, of its high resistance to freezing-thawing weather and the scaling action of de-icing salts. Longitudinal structural crack shows some ravelling. Note perfect transverse joint.

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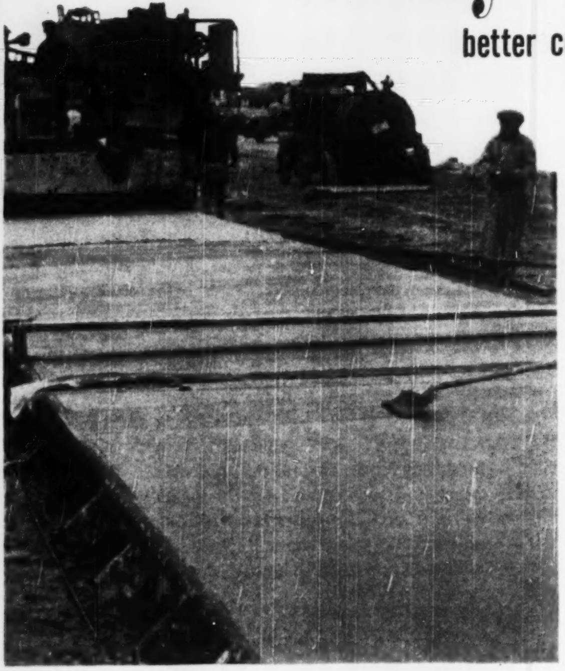

Note how closely finishers work behind the mixer on this Duraplastic paving job. Route 25, Section 32A, New Jersey. Designed by New Jersey Highway Commission. Contractor: Robert W. Cleveland & Co., East Orange, N. J.

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ENGINEERING NEWS-RECORD

MARCH 23, 1950 VOL. 144 NO. 12

Federal reorganization plan avoids construction issues

Minor construction reshuffling included in Presidential reorganization program, but major issues aren't included —HHFA and PHS get building loan authority

Federal construction activities will undergo minor reshuffling if Congress accepts the reorganization plans that President Truman submitted last week. Some proposals have considerable significance.

Federal loans for advance planning of local public works would pass from the General Services Administration to the Housing and Home Finance Agency. Similarly, GSA would lose both planning and construction loans for water treatment plants under the federal pollution control program. This would go to Public Health Service, which already has to approve them.

But in the main, the President avoided the big controversial issues such as merger of Army Engineer civil functions with Reclamation, reorganization of the Veterans Administration, and transfer of home-financing activities—the RFC's mortgage purchasing function, for example—to HHFA. He indicated that he would send other plans to Congress later this year.

Reorganization plans take effect automatically in 60 days unless revoked by a majority vote of either house before then. Twenty-one plans went to Congress March 13.

• **Most plans agreeable**—Most will get no objection from Congress. They conform generally to recommendations of the Hoover Commission. None of the construction agency transfers is expected to arouse opposition.

One proposal of importance to construction engineers and contractors would create an Under Secretary of Commerce for Transportation. He would be administrative officer not only for the Bureau of Public Roads—shifted last year to Commerce—but also for another two-part unit the President proposes to put there to take over all functions of the Maritime Commission.

The new doublebarreled agency would consist of a Federal Maritime Board to award ship subsidies and handle all regulatory functions, plus a Maritime Administration to perform all administrative duties, including supervision of ship construction. A questionable feature of the plan is that one man would serve as chairman of both the board and the administration.

• **Not complete solution**—Critics contend that the proposal only partly resolves the Maritime Commission mess. The President's old friend, Maj. Gen. Philip B. Fleming—now chairman of the commission—could undoubtedly have the new two-hat job if he wanted it. He has been mentioned also as the President's first choice to become Under Secretary for Transportation—against some opposition because he has sided with the majority of the commission in granting subsidies regarded by many as excessive.

In accord with Hoover Commission recommendations, the President's plans propose to give definite top authority to the heads of six departments, and to vest all administrative responsibility for seven regulatory agencies in their chairmen. These changes would:

1. Concentrate in the heads of the six departments—Interior, Labor, Commerce, Justice, Agriculture and Treasury—the powers and functions now conferred on subordinates; and
2. Put administrative control over their agency staffs in the hands of the chairmen of the Federal Power Commission, the Civil Aeronautics Board (not to be confused with the Civil Aeronautics Administration that handles the federal-aid airport program), the Interstate Commerce Commission, the Federal Communications Commission, the Federal Trade Commission and the Securities and Exchange Commission—in addition to NLRB.

• **New posts created**—Some new posts would be created by the President's plans. He proposed an administrative assistant secretary for each of the six departments already named. In addition, the proposals would add a new assistant secretary in the Interior Department, which now has two, and two assistant secretaries in Agriculture, which has only one now.

Some construction industry representatives detect a trend toward undesirable centralization in the transfer to HHFA of advance planning loans for local public works. They fear that one agency will have too much to say about local plans. HHFA already has the responsibility for approval or rejection of plans for federally subsidized public housing, slum clearance and urban redevelopment. In that light, the proposed transfer of public works planning has some logic to back it up, as does the transfer of waste treatment loan authority to Public Health Service.

ARBA explains Upham retirement

Taking exception to the story headlined "Upham to resign as ARBA director," (March 9, p 17), the American Road Builders' Association, through Allen Wagner, its director of public relations, has provided ENR with the following comment and explanation:

"Your speculative story erred in so many respects and so clearly left the impression that Charles M. Upham, engineer-director of ARBA, was not parting in a friendly manner with the organization he had headed since 1926, that the following facts should be published in the interests of accuracy:

"Mr. Upham never was 'notified' by 'several manufacturers through President E. R. Needles that if he failed to resign they'd quit ARBA.' Mr. Upham did not resign at the ARBA meeting in Cincinnati. He retired. There were no 'candidates' for his position, as stated in ENR. Neither Jennings Randolph nor Harold F. Hess were, or are, in any sense 'candidates.' Nor was there ever any 'agreement' on Allen Wagner, the ARBA's public relations director, as acting director.

"Each department head in the ARBA headquarters in Washington, D. C., is operating his own department while a committee of the ARBA board of directors selects a successor to Mr. Upham. Policy matters are being guided by President Needles and Jennings Randolph, ARBA treasurer.

(Continued on p 76)

Navy device confirms USBR engineers

First reports of Navy soundings in Lake Mead during 1948-49 verify pre-construction estimates by Reclamation Bureau engineers that the 32,000,000-acre-ft reservoir behind Hoover Dam won't fill with silt until the year 2200—even under present conditions. The results, based on a dozen years of use, make it plain that the generators at Hoover Dam can continue present energy output for another 100 years—more than enough time to pay out the 50-year contracts for the reimbursable power features of the project.

With the construction of presently planned upstream works (such as Bridge Canyon Dam at the head of Lake Mead and Glen Canyon Dam farther up in Utah) the useful life of Lake Mead and the Hoover Dam power plant will be greatly prolonged. Contemplated works on the headwaters of the Colorado will reduce the silt load further.

Navy operators used fathometer equipment to make the soundings in a cooperative study with the U. S. Geological Survey for the Reclamation Bureau. The results are now being coordinated for release within a month.

In only one detail did the pre-construction estimators make a minor error of judgment. They expected the silt deposits to spread down the lake toward the dam. The soundings show that the solid particles settle out immediately in the first quiet water they reach at the head of the 115-mi lake. Only colloidal material travels as far as the dam. Much of it probably goes through the penstocks. What remains is so much in suspension that it could be measured only by laboratory analysis of samples.

◆

Public officials advised on engineering services

The Boston Society of Engineers has mailed to all municipal officials in Massachusetts a copy of its "Recommended Procedure for Securing Professional Services by Public Authorities." The recommendations, prepared by a special committee of the society, were endorsed by the membership last fall by a vote of 292 to 8. The committee was set up in 1947 to look into the legal requirements in Massachusetts respecting competitive bidding for professional services, about which there was misunderstanding and differences of opinion. As an outgrowth of the work a bill was recently introduced in the legislature entitled "An Act Eliminating the Necessity of Competitive Bidding for Public Contracts Requiring the Performance of Professional Services."

In the information sent the municipal officials, after a preamble discussing the disadvantages of competitive bidding from a public interest standpoint, the following three-step procedure is recommended.

1. Determine by inquiry from properly informed sources the names of one or more engineers or engineering firms who may be qualified and available for the particular engagement.
2. Interview one or more of the said engineers and examine his or their qualifications.
3. Select one engineer and negotiate with him an agreement as to the nature and extent of the services to be rendered and the basis of payment. If a question arises as to the reasonableness of the fees to be charged, the Public Authority should seek advice from recognized authorities such as the American Society of Civil Engineers. If an initial agreement for engineering services upon a project is limited to a preliminary investigation and report, then the agreement should commit the engineer as to availability and as to limiting fees, in case complete professional engineering services are desired at a later date.

◆

ARBA gives explanation of Upham retirement

(*Continued from page 75*)

"The ENR story asserted Mr. Upham would be 65 in 1952. Mr. Upham will be 65 in March of 1951, and arrangements for his retirement from active management of the ARBA headquarters at this time are identical with the provisions made late in 1948. Mr. Upham will continue to receive his salary in full for the next year, during which he is to serve ARBA as a consultant, actively assisting in its policies and program. In addition, for five years following Mr. Upham's 65th birthday in March of 1951, he is to be retained as a consultant and receive a salary in addition to the pension provided by ARBA."

ENR is glad to publish this explanation of the situation to clear up any misunderstanding that its earlier story may have created.

Labor regrouping affects construction

The construction industry particularly would be affected by President Truman's proposal that federal reorganization eliminate the office of General Counsel Robert N. Denham, of the National Labor Relations Board.

Another Presidential reorganization plan—to center in the Labor Department administration of wage statutes—also affects construction.

Elimination of Denham's job would affect differences between the powerful general counsel and NLRB itself over how the Taft-Hartley Act should be applied to construction. Major among these differences are jurisdiction and secondary boycotts. Denham has sought liberal application of NLRB jurisdiction to construction, particularly smaller contractors and activities having a minor effect on commerce. In secondary boycotts, he has attempted to enforce the act strictly.

In cases of both types, Denham has been overruled repeatedly—a trend which can be expected to increase.

• **Shouldn't affect elections**—If the reorganization takes place (it will unless disapproved by either branch of Congress within 60 days), it probably won't alter the situation regarding union shop elections on construction projects. Denham considers these impossible. NLRB is disinclined to do anything about them, despite the hearings it held in December (ENR Dec. 22, 1949, p 23).

The other reorganization plan affects such laws as these:

1. The 8-hour-day law, covering federal contracts for public works.
2. The Davis-Bacon Act, requiring "prevailing wages" on construction and repair of federal works.
3. The "anti-kickback" law.
4. Certain other laws requiring that "prevailing wages" be paid on construction financed by loans or grants from, or by mortgages guaranteed by, the federal government. These are the National Housing Act, the Housing Act of 1949, the Federal Airport Act and the Hospital Survey and Construction Act of 1946.

Mr. Truman said the objective of this plan is to establish uniform procedures for determining wage standards and their enforcement through the Labor Secretary while enforcement is left to awarding agencies and those providing federal assistance.

Mississippi Valley highway bureaus face new problems in road building

Contractors are plentiful and anxious for new work, but lack of funds threatens to block some states' 1950 road building programs

J. R. Carr
Associate Editor

Less than two years ago highway departments, especially those in the midwest, were deeply concerned about the shortage of contractors and the ever-mounting construction costs. They still had sizeable wartime accumulated backlogs of funds to match federal appropriations, but they couldn't find enough designers or field engineers.

Today, however, there are plenty of contractors, but some states are caught short of funds for matching federal aid. That was the dominating subject as the Mississippi Valley Conference of State Highway Departments wound up its 41st annual meeting which was held in Chicago March 11.

Of the 15 midwestern member states in the Mississippi Valley, Illinois and Michigan seem to be the most sorely pressed for road building funds. Consensus of the group was that drastic improvements in public relations are needed to educate the public on the economic need for highway improvement. Also to secure more state and federal funds for new highway construction, and for the maintenance and improvement of existing highways.

• **Contractors seeking contracts**—Most of the states reported sharp reductions in unit contract costs, but some engineers viewed this downward trend as temporary—caused chiefly by overanxiety of the contractors to land contracts early in the year.

The supply of designers and field engineers appears to be adequate for the programs scheduled this year, at least, and one large state highway department frankly admitted that its curtailed highway program would sharply reduce the number of engineering graduates ordinarily hired each June.

Over 300 state and federal engineers attended the three-day meeting—oldest highway conference in the United States. H. E. Surman, engineer of design, Illinois State Highway Department, was elected president, succeeding Carl Vogelgesang, Indiana State Highway Department. P. H. Daniels, assistant chief engineer, Missouri State Highway Department was elected secretary-treasurer.

In resolutions adopted at the closing session, the conference urged the authorization of federal aid highway funds well in advance of initiation of the work to permit long-range planning, and especially the advance purchasing of right-of-way.

The 15 states heartily endorsed all items in the ASCE policy for an expanded highway program based on $810 million of federal funds per year ENR Dec. 1, 1949, p 13), but they opposed the granting of federal highway funds for secondary road construction to any political subdivision below the county level.

• **Significant highway trends**—Significant trends in highway design and construction, as reported by the technical division of the conference include:

In-service training programs for college graduate engineers are producing beneficial results . . . more aerial surveys are being used in location work . . . expansion joints are being eliminated in concrete pavement, and there is a trend toward sawing contraction joints in pavement and filling them with a poured joint filler . . . subsealing of pumping pavement with asphalt is growing in favor, while less nonstripping additives are being used in asphalt work . . . wider and better-built road shoulders are being specified on new construction to permit adding future pavement lanes . . . granular subbase is being extended over the full width of embankment, for better drainage . . . side forms for widening of bituminous pavements are being eliminated . . . and there is a trend toward more simplification and mechanization of construction procedures.

• **Some needed improvements**—Improvements needed in bridge and highway construction and maintenance, include: sturdier road forms to carry the heavier concrete paving equipment . . . more research on pile driving and load-bearing capacity of piling . . . better enforcement of weight restrictions on highway during the spring thaws . . . more-permanent pavement marking . . . larger and higher-mounted highway signs . . . better quality control of asphalt mixes and ready-mixed concrete used in bridge and highway construction.

As a point of economy, some states are eliminating the final cross-sectioning on heavy grading jobs; contractors seem willing to accept the states' final estimates based on the design cut-and-fill sections.

Reductions in contract costs—a noticeable trend during the past several months—have been coming out of the contractor's profit. This theory was advanced in a meeting of the AASHO-AGC Joint Cooperative Committee, held in conjunction with the highway conference. One contractor reported that rising labor costs are nearly offset by increased productivity.

THEY'LL SHAPE WATER POLICY—President Truman's new Water Resources Policy Commission is to report and recommend on numerous knotty water policy issues this year. Left to right, seated, are R. R. Renne, president, Montana State College; Lewis Webster Jones, president, University of Arkansas; Morris L. Cooke, consulting engineer, chairman. Standing, left to right, are Leland Olds, former Federal Power Commissioner; Samuel B. Morris, general manager and chief engineer of the Los Angeles Department of Water and Power; Paul S. Burgess, dean of agriculture, University of Arizona; and Gilbert F. White, president of Haverford College.

Pump makers, associations fined in anti-trust case

Fines totaling $102,500 were imposed early in March on a group of vertical turbine pump manufacturers for price fixing agreements in an antitrust case in federal court at San Francisco.

The pumps are widely used by municipalities and farmers for both domestic and irrigation water.

Judge Louis E. Goodman fined two associations, 12 corporations and 13 individuals. The defendants all pleaded nolo contendere.

Assistant Attorney General H. A. Bergson, in charge of the Anti-trust Division, said that as a result of "this deliberate violation of the antitrust laws, approximately 90% of all sales of vertical turbine pumps have been made in a market devoid of price competition." The defendants were accused of raising prices an average of 60% by their activities. Sales of the firms involved totaled $44,000,000 in 1948, the last complete year for which records were available when the suit was filed last December.

The two associations, the National Association of Vertical Turbine Pump Manufacturers and the Turbine Pump Manufacturers Association, both of Los Angeles, were fined $5,000 each, charged with being the vehicles of the price fixing agreements.

Also penalized $5,000 each were Byron Jackson Co. and Johnston Pump Co., both of Vernon, Calif.; A. D. Cook, Inc., Lawrenceburg, Ind.; Deming Co., Salem, Ohio; Fairbanks, Morse & Co., Chicago; Food Machinery & Chemical Corp., San Jose, Calif.; Layne & Bowler Corp., Los Angeles, and Layne & Bowler, Inc., Memphis, Tenn.; Wintroath Pumps, Inc., Alhambra, Calif.; Worthington Pump & Machinery Corp., Harrison, N. J. Fined $3,000 each were American Well Works and Aurora Pump Co., Aurora, Ill. An official for each company was fined, as was the secretary-treasurer of the associations.

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Simplified prestressing

A concrete beam prestressed by a method developed by Karl P. Billner, inventor of vacuum concrete, proved to be of high strength when tested. The prestressing method, claimed to be economical, makes use of $\frac{3}{8}$-in. wires continuous through the beam, which is precast in two sections. The wires are anchored in the beam ends by bond but elsewhere are coated with asphalt to prevent bond. Prestressing is accomplished either by jacking the two sections apart and filling the resulting space with grout, or by jacking up one end and holding down the center while grout is injected into the opening. The prestressed beam above, when tested by the civil engineering department of Brooklyn Polytechnic Institute, did not crack until the beam was carrying twice the design load.

Big projects recommended for Cook Inlet, Alaska

Construction of power, flood control and navigation projects in the Cook Inlet area of Alaska at an estimated cost of $50,000,000 has been recommended by the office of the North Pacific division, Corps of Engineers.

The principal power project included in the recommendation provides for construction of a low dam near the outlet of Eklutna Lake 60 mi northeast of Anchorage, a tunnel and penstock to carry water to the Knik River and a power plant with installed capacity of 31,800 kw. Cost of this project is estimated at $25,240,000.

Two other projects in the Kenai peninsula would provide an additional 18,400 kw. These projects, estimated to cost $10,914,000, provide for intake structures, tunnels, penstocks and power plants at Cooper and Crescent Lakes.

The three proposed projects would provide needed power for the Anchorage, Fort Richardson and Seward region. Transmission facilities and substations required to connect the three power plants would cost an estimated $9,500,000.

Also recommended in the report are small craft harbors for fishing vessels at Seldovia, Homer and Nilichick on the southwest coast of Kenai peninsula, at a cost of $843,450.

OBITUARY

W. H. Johnson, 61, a civil engineer whose special field was in the construction of airports, died at Atlanta, Ga., Feb. 25.

John Charles Hiteshew, civil engineer, died March 1 in Pittsburgh, Pa. He had been city engineer of Carlisle, Pa., for six years and of Waynesboro, Pa., for two years. He was chief of construction of the Pennsylvania Highway Commission for three years before becoming borough manager of Sewickley.

Frank T. Darrow, 74, former chief engineer for the Burlington RR. at Chicago, died at Riverside, Ill., Feb. 28. He was a C. E. graduate of Allegheny College, 1897.

Abraham C. Fisher, an engineer with the Philadelphia, Pa., Department of City Transit died March 7 at Philadelphia.

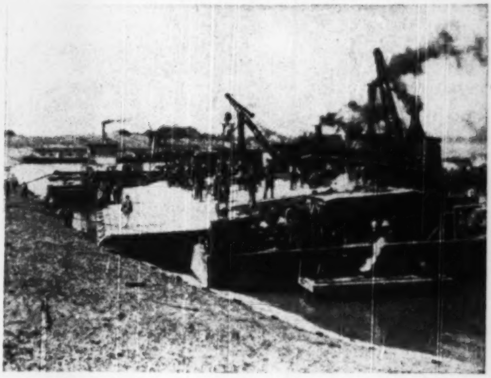
Harry W. Baum, 75, construction engineer, Pasadena, Calif., a graduate of the civil engineering department, University of Illinois, 1895, died March 3. He constructed the Broadmoor Hotel, just outside Colorado Springs, Colo., also state capitols in Salt Lake City, Utah; Oklahoma City, Okla.; and Boise, Idaho, as well as Camp Douglas, Utah, the first cantonment in World War I, which was completed in 25 working days, and Camp Pike, Ark., which accommodated 30,000 soldiers.

James Douglas Jordan, 43, an engineer for McGuire & Hester, an Oakland, Calif., pipeline contracting company, died recently. Formerly he was an engineer for the State Division of Highways, which he joined as a junior draftsman when he was 17. He became associated with the Oakland firm in 1944, following his discharge from the Army.

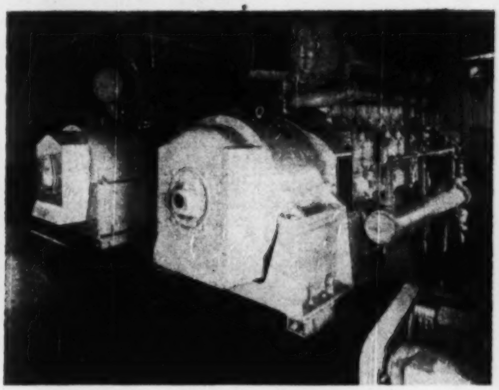
Malcolm J. Newman, 49, head of the hydroelectric power section, Galveston, Tex., district office of the Corps of Engineers, died Feb. 11. He attended the University of Tennessee and had been employed by the TVA, Aluminium Co. of America, and Corps of Engineers on a number of large projects.

Louis E. Vierheller, former civil engineer for Pittsburgh, Pa., died March 3. He retired recently after 54 years service.

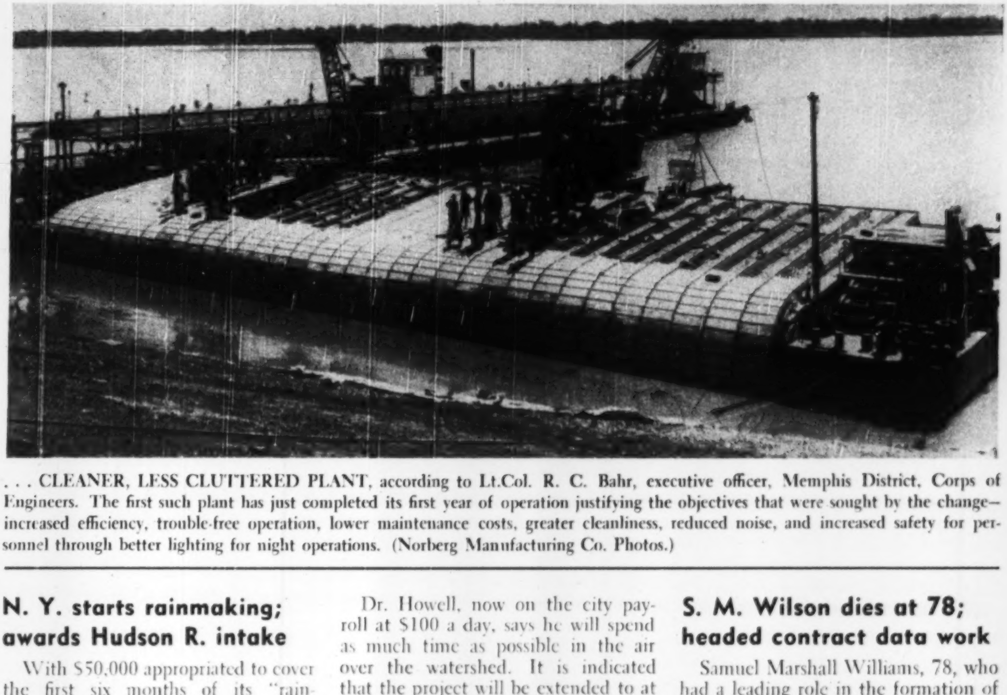
Modern mattress-sinking on the Mississippi



FAMILIAR STEAM OPERATION YIELDS TO . . .



. . . DIESEL-ELECTRIC POWER UNITS, GIVING . . .



. . . CLEANER, LESS CLUTTERED PLANT, according to Lt.Col. R. C. Bahr, executive officer, Memphis District, Corps of Engineers. The first such plant has just completed its first year of operation justifying the objectives that were sought by the change—increased efficiency, trouble-free operation, lower maintenance costs, greater cleanliness, reduced noise, and increased safety for personnel through better lighting for night operations. (Norberg Manufacturing Co. Photos.)

N. Y. starts rainmaking; awards Hudson R. intake

With $50,000 appropriated to cover the first six months of its "rain-stimulation project," New York City was to start limited operations this week. Rainmaking consultant Wallace E. Howell (ENR Mar. 9, p 21) said full scale operations will be under way in six to eight weeks.

Two Police Department planes and two mobile ground generators of silver iodide vapor will operate by radio control from a radar-equipped meteorological station to be located somewhere in the watershed. The radar will be used to spot potential rain clouds. Planes will be equipped for dispensing dry ice as well as the silver iodide smoke.

Dr. Howell, now on the city payroll at $100 a day, says he will spend as much time as possible in the air over the watershed. It is indicated that the project will be extended to at least a year so that sufficient data can be gathered for accurate evaluation of its results.

• **River intake**—Tuller Construction Co. and A. J. Dillenbeck, joint-venturers of Red Bank, N. J., were awarded the contract for design, construction and four months' operation at the 100-mgd pumping plant on the Hudson River at Chelsea, N. Y.

Their bid, $2,684,000, was third low. The low bidder (ENR Feb. 23, p 24) was disqualified as no professional engineer was named in his proposal; the second low bid was rejected by mutual consent.

S. M. Wilson dies at 78; headed contract data work

Samuel Marshall Williams, 78, who had a leading role in the formation of the Bureau of Contract Information for more than 10 years, died March 10.

Prior to the first World War, Mr. Williams became interested in the good roads movement and carried on promotional activities in that connection. In 1928 he joined the national staff of the Associated General Contractors of America as manager of the engineering construction division, and undertook work which led to the formation of the Bureau of Contract Information, Washington, D. C., which has been and continues to be of the greatest value to the whole construction industry.

CONSTRUCTION BUSINESS

March volume holds 1950 boom rate

Contract awards last week totaled $213 million, week before $210 million—thus raising this year's average so far to $196 million per week. That's 38% higher than for the same eleven weeks a year ago.

The current boom in contracts is strongest in private construction, now 50% above a year ago. Mass housing accounts for a large proportion of the spurt in private building—$188 million in mass housing contracts in March alone, $98 million of it just this week.

Also, industrial building, which should have slumped 13-15% according to all of the forecasts, has recently turned upward so strongly that industrial contracts to date are now 3% ahead of a year ago. Industrial contracts in the first two months of 1950 were down 12% from last year.

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Concrete paving awards double year-ago volume

Concrete pavement awards in February were double the volume of a year ago, totaling 2,322,370 square yards, according to the Portland Cement Association.

Roads were up 128% from a year ago, while streets and alleys were up 70% and airports 118%.

This surge in volume brings 1950 54% ahead of 1949 so far, with a total of 5.7 million square yards contracted in the first two months of the year.

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Cement shipments 10% above last year

Shipments of portland cement in January were 10% above a year ago, but declined seasonally from December to total 9,593,000 barrels.

Stocks of cement as of January 31 were up 15% from a year ago to 20.3 million barrels; January production of 15.2 million barrels exceeded shipments by 58%, as is usual this time of year.

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Housing boom continues

The housing boom keeps right on rolling—a record 80,000 units started in February, BLS reports. Starts in both January and February were 59% above last year.

Equipment shipments down in fourth quarter

Total of excavating and earthmoving equipment shipments reported by the Census Bureau for the fourth quarter are valued at $93.6 million. This compares with $98.6 million in the third quarter, $139.0 million a year ago and a quarterly average of $130.6 million during the peak year 1948.

Export business, for equipment other than power shovels and cranes (not reported), boomed throughout 1949. Shiments in the final quarter were 12% above the third quarter and 25% over the fourth quarter of 1948.

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Cost indexes rise

- **ASC**—The cost index of Associated General Contractors increased in February to 346 (1913 = 100), 0.3% above the record January high of 345.
- **SH&G**—February costs were up 0.5% from January, according to the building price index of Smith, Hinchman & Grylls, Inc. The SH&G index for February stands at 215 (1926 = 100), compared with 214 in January and a 1949 mid-summer low of 210.

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Wage briefs

- **Canada**—Plumbers may crack Canada's 1950 wage front. The weak point on the line: Toronto.

Plumbers in Toronto are holding out for a 25-cent raise to $2.00 an hour. They are already the highest-paid plumbers in Canada.

One piece of ammunition in the Toronto Plumbers' Union arsenal: they claim they can migrate to the oilfields of Alberta and do better—unless they get this raise.

- **Milwaukee**—AFL construction trades in Milwaukee, Wis., are generally demanding a 25-cent wage increase this spring, but carpenters want 40 cents in order to equal the bricklayers' present rate of $2.50.
- **Alaska**—Hoisting Engineers in Alaska received an increase of 57 cents an hour under a new contract negotiated between contractors and Local 302, Hoisting Engineers' Union, at Seattle, Washington.

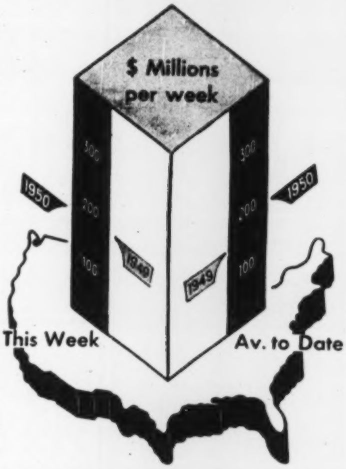
The union had 2,200 members employed in Alaska last year.

Though the hourly increase is high, it actually amounts to a net increase of about $10 per 60-hour week, because of an increase in board bills from $1.50 a day to $5.75.

COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Mar. '50	488.35	234.75
Building Cost	Mar. '50	359.98	194.59
Volume	Feb. '50	305	134



Activity This Week

As reported to ENR
(in millions of dollars)

Amount of contracts let

	Week of Mar. 23* 1950	Cumulative 1950 (12 wks.)	Cumulative 1949 (12 wks.)	% chge
Federal	$16.4	$383.2	$305.2	+26
State & Mun.	49.4	645.1	572.4	+13
Total Public	$65.7	$1,028.3	$877.6	+17
Total Private	111.6	1,308.0	862.7	+52
U. S. Total	$177.3	$2,336.3	$1,740.3	+34

* 4-Day Week

Contracts by type of work

	This Week	Cumulative 1950 (12 wks.)	Cumulative 1949 (12 wks.)	% chge
Waterworks	$4.0	$62.2	$32.7	+90
Sewerage	5.1	52.8	45.5	+16
Bridges	4.3	72.4	83.9	−14
Highways	14.4	199.0	113.3	+76
Earthwork, Waterways	5.9	72.4	160.3	−55
Buildings:				
Public	26.7	486.3	387.8	+25
Industrial	9.2	224.2	242.5	−8
Commercial	90.1	791.4	543.8	+79
Unclassified	17.6	195.6	130.4	+50

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

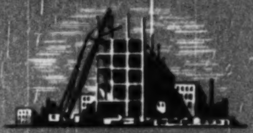
New capital for construction

	Cumulative 1950 (12 wks.)	Cumulative 1949 (12 wks.)	% chge
NON-FEDERAL	N.A.	N.A.	N.A.
Corporate Securities	"	"	"
State and Municipal:			
Excl. Housing	"	"	"
Housing	"	"	"
FEDERAL	"	"	"
Total Capital	"	"	"

N.A.—not available

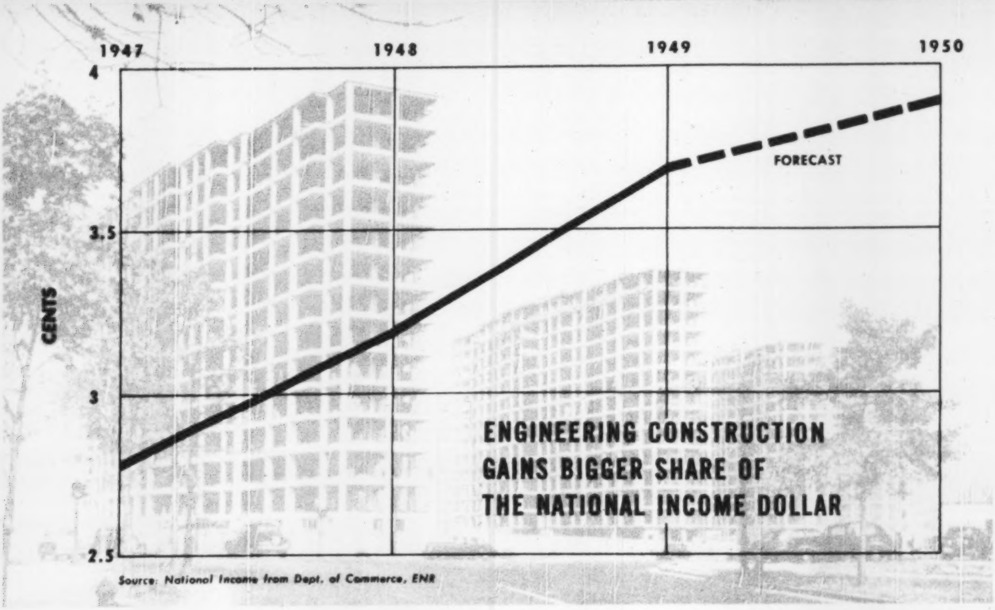
CONSTRUCTION

1949-1950



Construction set new records in 1949...
and prospects are that they will be surpassed in 1950.
Demand for construction continues unabated
as backlogs of proposed projects exceed all previous totals.
As an enduring monument to our life and times, the construction
fraternity's achievements are impressive indeed... but,
The challenge of the future
presents a task of even greater dimensions!
This analysis attempts to examine and appraise the social and
economic forces now at work that will affect the future of construction.

PREPARED BY THE STAFF OF ENGINEERING NEWS-RECORD
MARCH 23, 1950



Source: National Income from Dept. of Commerce, ENR

Construction Boom Continues

'49 Set New Records, '50 Looks Even Bigger

THIRTY BILLION DOLLARS PLUS

New records are in sight for the construction industry in 1950:

Engineering Construction — measured by Engineering News-Record's contract awards — is expected to gain 5%, to top $8.5 billion.

New construction of all kinds will probably equal 1949's record of $19.3 billion — and may well gain slightly.

Wage rates may rise slightly and material costs are likely to be stable, but increased efficiency can bring down prices to buyers.

★ ★ ★

These figures only partially illustrate construction's key place in the economy. The Commerce Department this year is revising its reports on new construction — raising the total to between $22 billion and $23 billion. In addition, although the statistics do not measure it well, maintenance and improvements on existing facilities — rangng from homes to power dams — may well run $8 billion to $10 billion a year. In total then, the construction industry accounts for roughly 15% of the national income. Touching the lives of every person in the country, construction and the industries dependent on it, such as highway transportation, are basic to the entire American economy.

THE CONSTRUCTION INDUSTRY is looking to new records for 1950 — after reaching new heights in 1949.

Engineering construction scored a postwar high in 1949 — in both dollar volume and in the physical amount of work done, although it is sobering to reflect that the physical amount was less than in four other years — '28, '29, '41 and '42. Engineering construction also outpaced other kinds, even though total 1949 construction moved up to a postwar dollar record of its own.

GAINS 15 PERCENT OVER 1948

As measured by the total of contract awards reported to ENR, engineering construction reached almost $8.2 billion in 1949. That was a 15% dollar increase over 1948 and 11% more physically. It means that 3.7 cents of each dollar of the national income went for engineering construction. Record expenditures were made in all but two classes of work — roads and factories.

Total new construction – public and private including homebuilding–as estimated by ENR on the basis of contract awards, totaled $17.9 billion. As measured by the Department of Commerce on the value of work put in place, it reached $19.3 billion. An all-time record for dollar volume, it was up 3% from the year before and accounted for 10 cents of each dollar of national income. Standing out in this record: the starting of 1,023,000 homes, almost 10% more than the former record of 1925. Highlight of the homebuilding field during the year was a spectacular increase in rental-type housing. Much of it was engineered construction – as is shown by the fact that ENR's contract awards on mass housing projects jumped 37%.

LOOKING AHEAD INTO 1950

This year is likely to see new records in almost every part of the heavy construction industry.

Overall, engineering construction contracts may well be up 5% – or more. That would be a total dollar volume of more than $8.5 billion. With construction costs, as measured by the *Engineering News-Record* Construction Cost Index, expected to be fairly stable, physical volume of work done will also rise. The prospect is, too, that heavy construction will account for a larger share of the national income in 1950 – roughly 4 cents out of the dollar. It accounted for about 4½ cents in 1928 and 1929 and as much as 6 cents in the war year of 1942.

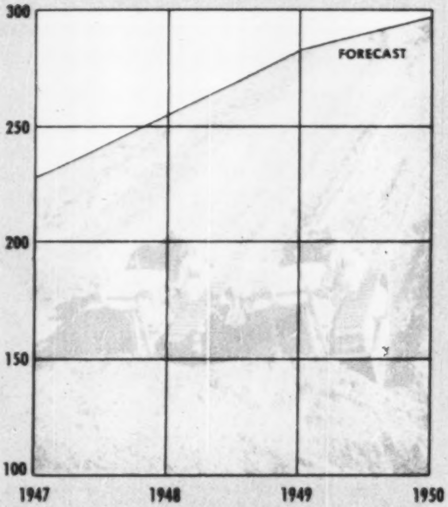
The construction industry as a whole started the year at a high level. It may well top 1949's record – although, most year-end forecasts put 1950 volume about the same as 1949's

☆ ☆ ☆

These are highlights from Engineering News-Record's look ahead into 1950 and review of 1949. Adding up of the industry's prospects is crucially important at this time. Last year was characterized by high-level activity in the industry, but it was also marked by the shift from postwar boom to strong competition. With the shift came two great changes – an adequate flow of materials and a sharp cut in costs, bids and selling prices. From wide-spread shortages of men and materials, the industry moved to peacetime competition within months – and did it not only without slumping, but actually while set-

PHYSICAL VOLUME OF CONSTRUCTION RISES*

1913 = 100

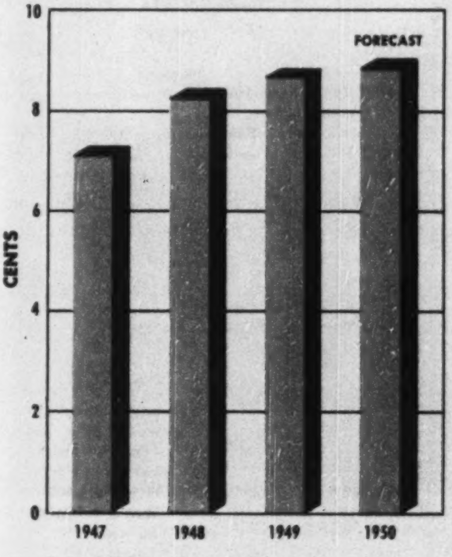


*Dollar volume adjusted for construction cost.

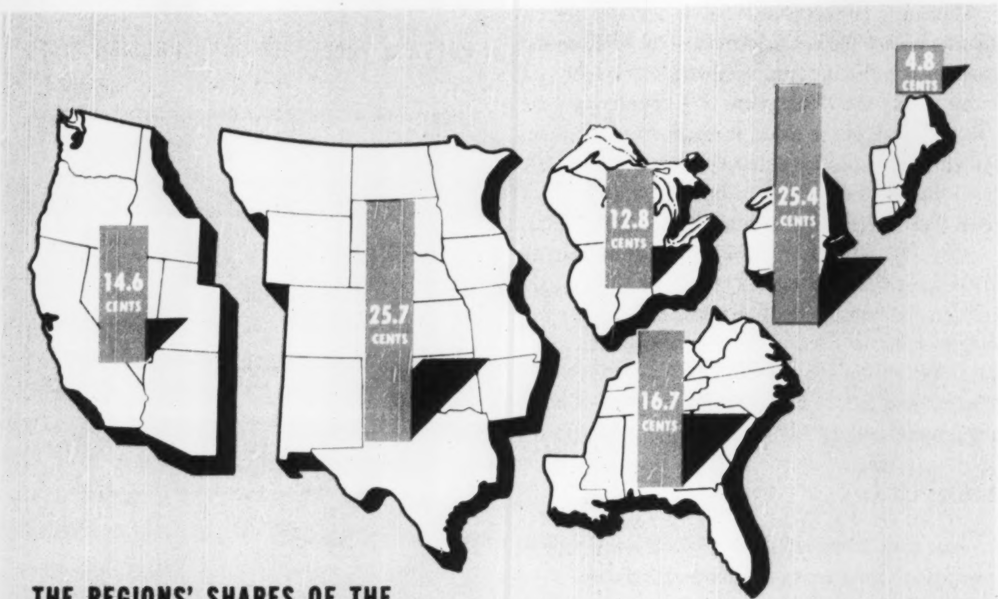
TOTAL CONSTRUCTION GAINS

All Construction, Including Homebuilding, As a Percent of the National Income Dollar

1947-1950



Source: U.S. Dept. of Commerce, ENR



THE REGIONS' SHARES OF THE ENGINEERING CONSTRUCTION DOLLAR IN 1949

ting new marks in volume of work done.

By all the signs, 1950 will be a year of still greater activity, particularly in heavy construction. But the industry's biggest problem – costs – will demand greater attention from contractors and engineers than it has since World War II began.

THE FLOW OF CONTRACTS

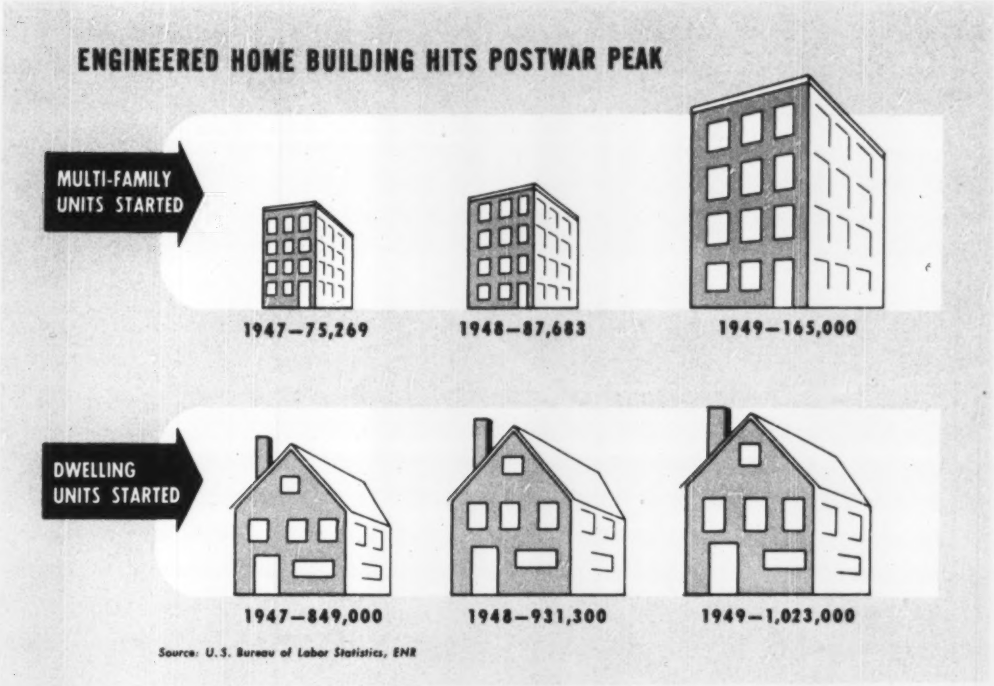
After rising ever since World War II ended, the volume of private engineering construction is expected to dip in 1950. From about \$3.9 billion last year, it may drop 5% to 8%. Forecast months ago, the drop is not likely to affect the total volume of work. The reason: Public construction is counted on to gain enough to more than offset the drop. But the shift will mean that more materials will go to, and more contractors will be working on, bridges, highways, dams and other public projects. Fewer, of course, will be absorbed by private industrial and commercial work.

The share of construction contracts flowing to each region is not likely to change dramatically in 1950. The accompanying map shows the importance of the country's six major regions from the industry's standpoint. It shows the share of all engineering con-

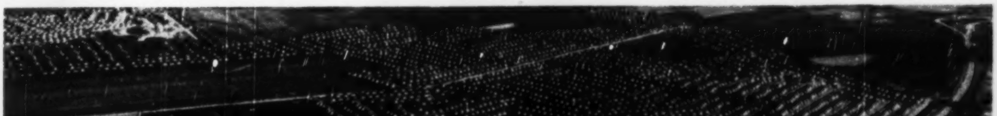
HOW REGIONS GAINED IN '49

Percent Change 1948 to 1949

Regions	Total Engineering Construction	Public Works Contracts	Federal Government Works	Private Contracts
United States	+15	+20	+27	+10
New England	+24	+21	+ 1	+28
Middle Atlantic	+ 6	+39	−15	−17
South	+29	+38	+157	+16
Middle West	+24	+3	+34	+46
West of Mississippi	+14	+3	− 9	+26
Far West	+11	+17	+29	+ 3
Canada	+20	+23	....	+17



Source: U.S. Bureau of Labor Statistics, ENR



This is mass housing – engineered homebuilding – and so is multi-story apartment building. Both together scored a big gain in 1949, will continue to boom in 1950. Picture is of Levittown, a new 10,000-home community on Long Island, built by one builder and valued at $80-million.

Highway construction, including bridges, accounts for 30% of all public works. More projects like this —the Detroit Industrial Expressway—are scheduled for 1950. Highway work in total may rise 10%.

struction contracts let in the nation that went to each region. Between 1948 and 1949 these shares fluctuated only moderately.

But—as the table shows—construction business within each region can change sharply from year to year. Last year, New England, the South and the Middle West saw their total volume of engineering construction gain more than 20%—running ahead of the country as a whole. New England's gain came primarily from private work and state and local government contracts—not from federal work. In the South, however, federal contracts jumped, and in the Middle West it was a combination of the federal program and surge in private work that carried the total up.

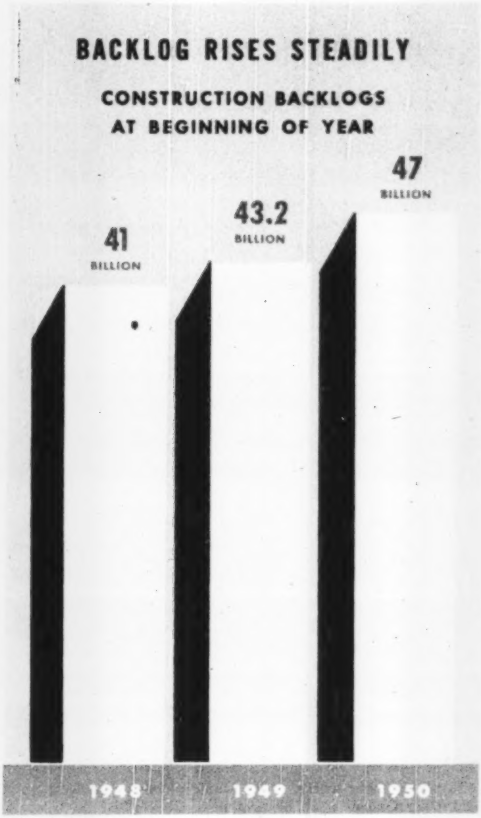
Other regions fell behind the pace of the nation. The Middle Atlantic recorded only 6% more contracts than it had in 1948. The Far West—where some kinds of construction, notably homebuilding, were tapering off after an unusual decade's growth—scored an increase of 11%, so falling behind the U. S. average.

Canada, whose contract awards totalled $614 million last year, reported a gain of 20% over 1948—a sharper advance than the 15% scored for the United States as a whole.

THE OUTLOOK FOR PUBLIC WORKS

Engineering construction in the public works field is expected to gain a sharp 16% in 1950 over 1949. The prospect is that public work will keep on rising steadily, although not as rapidly as it did between 1947 and 1949. From '47 to '48, ENR's contract awards for public work gained 43%. Last year they rose an even 20%.

Sharpest gain in the public field can come in public housing if local authorities take up the federal sub-


BACKLOG RISES STEADILY

CONSTRUCTION BACKLOGS AT BEGINNING OF YEAR

sidy offer. If they go the limit 60,000 public units could be started under the federal Housing Act of 1949, jumping activity in this field 80%.

Largest single chunk of the 1950 public works program will be in schools, hospitals and institutions, and other non-residential building. After years of postponing work, because of a shortage of funds in the depression and then a shortage of men and material during the war, school and hospital programs are counted on to stay at a high level for years ahead. School construction is expected to gain 10% or so in 1950 while hospital work may gain 20%.

Highways – which in many years have run to almost half of the total public works program – are expected to gain moderately this year. Highway work may rise 10% or so. As in 1949, highways plus bridges are expected to account for about 30% of all public works.

As shown in an accompanying table, results of *Engineering News-Record's* annual survey of highway programs in the 48 states and the District of Columbia point to a gain of as much as 20% in expenditures for construction, maintenance, and equipment.

Although figures for some states are not available, the survey indicates that the states' total highway expenditures will increase from slightly less than $1.5 billion in 1949 to about $1.8 billion in 1950. Maintenance expenditures are expected to gain 8%. New construction programs, at $1 billion in 1949, are scheduled to rise more than 20%. Equipment purchases, on the other hand, are expected to drop.

Miles of road built in 1949 by the states were about the same as in 1948. Figures for 44 states and the District of Columbia total 38,446 miles, compared with 40,798 for the entire nation in 1948. Construction in the four other states probably will bring the 1949 total up to 1948's.

While local governments – counties, cities and towns – are expected to spend more in 1950 than in 1949, their budgets are not likely to gain as much as the state programs. As a result, highway work as a whole will probably not be up quite as much as the state programs indicate.

With one exception – military construction – all other kinds of public works are counted on to gain moderately in 1950. Overall, federal, state and local government construction is expected to ring up a total dollar volume of about $6 billion. Percentage-wise, the gain is likely to be between 14% and 17% over 1949. Engineering construction contracts, as reported to ENR, in this field may well run close to $5 billion.

PROSPECTS FOR PRIVATE CONSTRUCTION

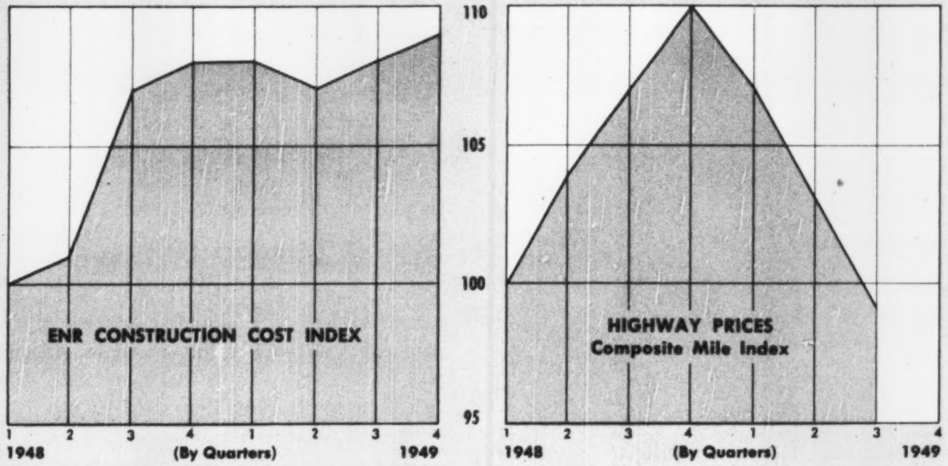
Privately-financed engineering construction actually gained in 1949. As reported to ENR, contracts for private work rose 10% to $3.9 billion. This year the prospect is for a decline of 5% to 8%.

Engineered private construction, however, deals with types of work in which the prospects for 1950 are relatively bright. Here is the outlook for the major types:

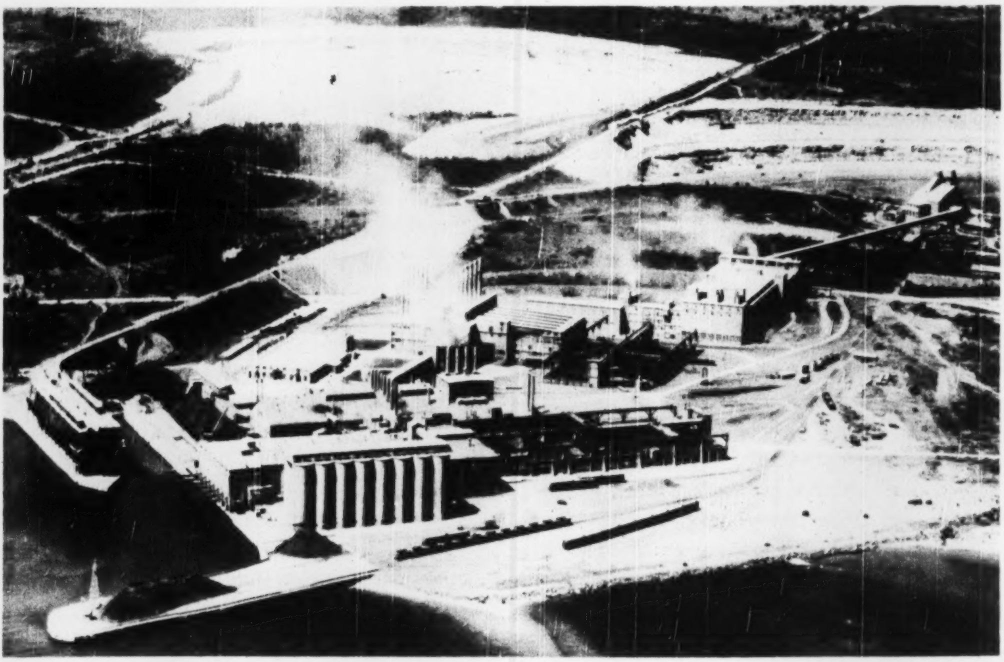
Industrial Work, which includes the construction contracts for utility work reported to ENR, promises to be fairly stable through 1950. After holding high

COSTS UP . . . PRICES DOWN

As Mechanization and Competition Increase on Roadbuilding



Source: U. S. Bureau of Public Roads, ENR



Production of cement, as of all other basic construction materials, is now adequate to meet the boom demand. This modern plant of the Huron Portland Cement Co., Alpena, Mich., is being expanded by the addition of new kilns. Photo by Abrams Aerial Survey Corp.

MATERIALS PRODUCTION AT HIGH LEVEL

	1947	1948	1949	1950 (Forecast)
BRICK Shipments Millions	4,934	5,714	5,050	5,250
CEMENT Shipments Thousand Barrels	187,395	204,329	205,000	209,000
LUMBER (Production) Million Board Feet	35,500	36,051	31,000	29,500
REINFORCING STEEL Bars Thousand Tons	1,453	1,542	1,600	1,700
STRUCTURAL STEEL Thousand Tons – Bookings	1,628	1,965	1,435	1,600

through the first part of 1949, it dropped sharply in the second half, ending the year 12% below the 1948 total. With the prospect of fairly stable costs, and with industry generally planning to hold its capital expenditures at a relatively high level, industrial construction in 1950 will probably be not too far below the 1949 level.

COMMERCIAL BUILDING, excluding mass housing, gained sharply last year in ENR's contract totals – and is likely to hold its own this year. Non-residential building of commercial types generally has lagged behind the sharp upward swing in homebuilding since the war. In the past, when homebuilding surged upward, it has taken a year or two before an accompanying boom in stores, garages and other commercial construction got underway. Today – if commercial building is to catch up with the new homes built in the last couple of years – it must stay at a high level, and perhaps gain slightly in 1950. More tall office buildings, which last year once again began to change city skylines, are in prospect.

Put together, then, the outlook for these two categories is for a small decline from the 1949 figures, but still for a high volume of work.

HOMEBUILDING in 1949 was featured by a big upsurge in mass housing. At $1.8 billion, it was almost half of all private engineering construction reported to ENR and outweighed industrial and commercial work put together.

As it stands now, the prospects for 1950 are better than forecasters have thought. In rental housing,

EQUIPMENT SHIPMENTS DIP IN '49

Excavating and Earthmoving Equipment

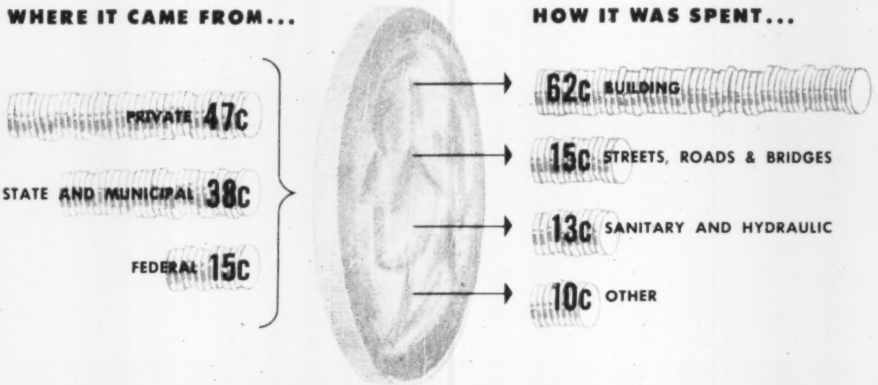
Equipment	MILLIONS OF DOLLARS		
	1947	1948	1949
TOTAL	437.2	522.5	468.0*
Power Cranes and Shovels	132.8	158.6	93.5†
Road Construction and Maintenance	99.3	119.4	103.5†
Dozers	20.5	26.5	23.5†
Other Tractor Mounted Equipment	20.2	19.0	15.0†
Tractors, Tracklaying	134.4	167.3	211.0†
Tractors, wheel type, heavy duty	18.5	20.7	14.5†
Drills, portable, well and blast hole	11.4	10.9	7.0†

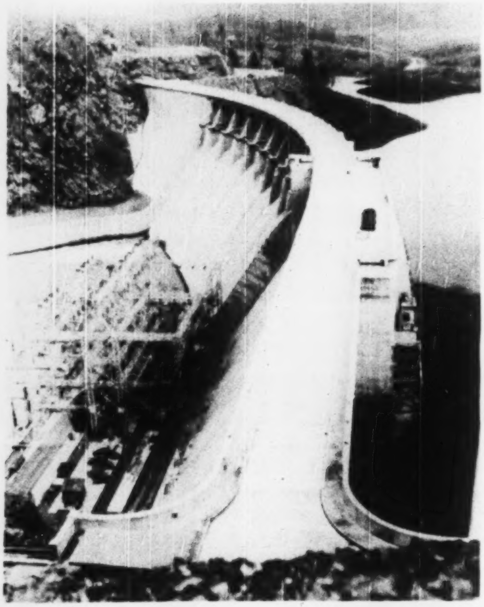
*Estimated by Department of Commerce

†Annual estimate based on projection of first three quarters data.

Source: Facts For Industry, Department of Commerce

The 1949 Engineering Construction Dollar





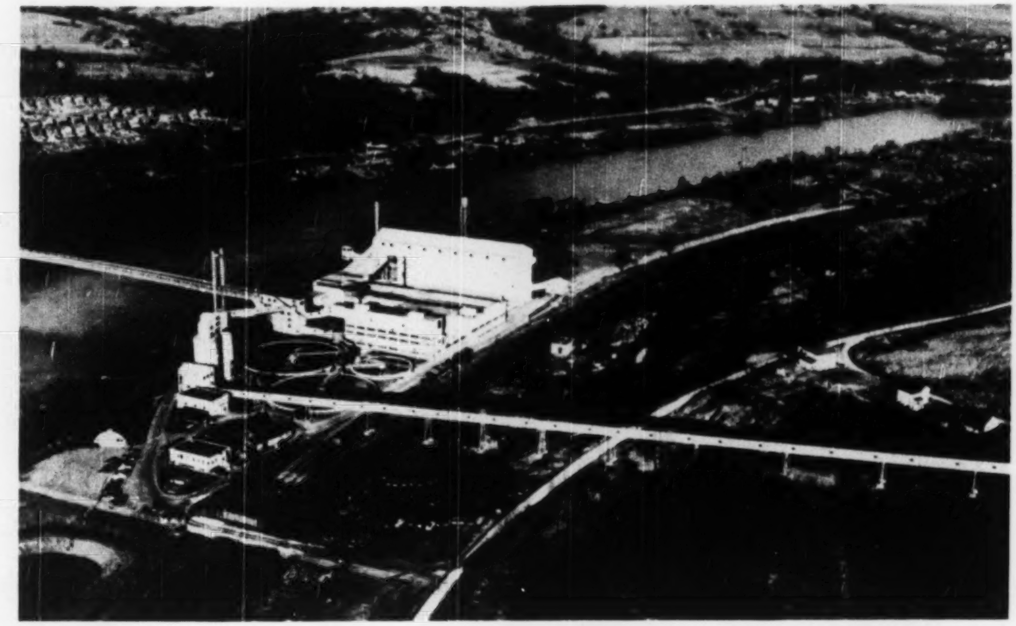
Dam construction took a bigger share of the engineering construction dollar than ever before. This is Allatoona Dam in Georgia, a Corps of Engineers project.

particularly, – the great bulk of which is engineering construction – 1950 may well top the record established last year.

Homebuilding starts at the turn of the year were running 50% higher than they had a year earlier. Applications for mortgage insurance by the Federal Housing Authority were running 51% above year-earlier figures. Mortage insurance applications on rental units were 200% higher.

RENTAL HOUSING AT HIGH LEVEL

As it looks now, private rental-type starts during the year may reach 250,000 – above what they were in 1949. Public housing starts, if they reach the envisioned 60,000 units, would almost double 1949's volume of public residential construction. The government has also declared its intention of aiding home construction for middle-income families. All these possibilities, plus the expected large number of owner-built homes engendered by high personal income levels, may well be enough to keep total housing starts around the 950,000 mark. That goal, however, depends upon continuing cutting of costs, say by another 5%.



Capital expenditures by industry, off 12% in 1949, will hold at about this level through 1950. Reason: efficiency must be kept high by new facilities such as this modern coal processing plant of the Jones & Laughlin Steel Corp. which includes a 1000-ft span suspension bridge connecting plant to mine by belt conveyor. F. H. McGraw & Co. photo.

INDUSTRY ATTACKS COSTS

Contractors made important progress in 1949 on their basic problem – costs. A sharp reduction in the actual cost of construction to the buyer helped boost the industry's volume during the year – and gives strong support to the outlook for 1950.

Actually, the costs of materials and wage rates – which are measured by the *Engineering News-Record* Construction Cost Index – dipped only slightly during the year. The Index finished the year at a new high, slightly above its 1948 peak. Actual costs to the buyer, however, were down – mostly in moderate amounts, although sharply in the highly mechanized field of road building. Actual road prices, as measured by the composite mile index of the Bureau of Public Roads, came down 10% from their peak. Federal agencies also estimate that homebuilding costs on the average came down 10%. On some large construction projects, too, bids submitted during 1949 ranged from 4% to 28% below bids on comparable jobs in the year before.

The greater part of these cost reductions came early in 1949. By mid-year, costs were firming. Materials and wage rates then turned upward. That brought a surge of contract awards as people rushed to get work underway before costs increased further.

For 1950 the prospects are that material costs will remain fairly stable. There may be small reductions. But, with construction activity expected to remain at a high level, material prices are likely to hold without major fluctuations.

Costs will depend heavily on wage rates in the industry. Last year wage advances were moderate and the prospect is that 1950 will see much the same pattern.

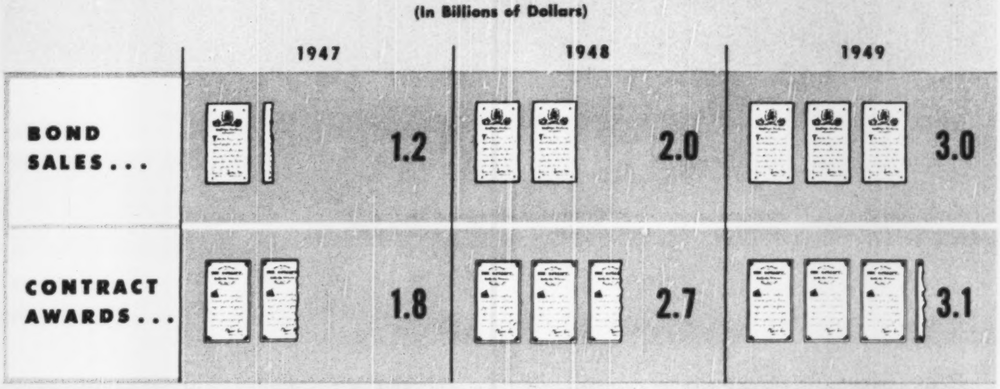
However – with materials and equipment in ample supply, and with competition favoring cost-saving practices – the prices buyers pay are likely to come down again as the year goes on.

EQUIPMENT AND MATERIALS OUTLOOK

After getting back to "normal" in 1949, the prospect is that 1950 will see stronger competition in the materials and equipment fields than has existed since World War II began.

Perhaps the most significant change in the industry in 1949 was the full flow of materials. Although the industry turned in its greatest dollar volume of

State and Municipal Bond Sales Rise Faster Than Contract Awards



work, supplies were adequate. Even with the six-week steel strike in the fall of the year, there were only scattered reports of shortages.

Production of key materials is expected to rise in 1950. Cement and structural steel, for example, are expected to top their 1949 marks as heavy construction work gains. Lumber and other materials going primarily into homes may decline slightly.

Construction equipment adjusted to its postwar "buyer's market" in 1949. Excavating and earth-moving machines, for example, after booming to a peak of $522 million in 1948 shipments, dipped to $468 million in 1949. Only in tracklaying tractors were 1949 shipments larger than 1948's. However, 1949 sales on the whole ran well ahead of 1947's.

The figures, and reports from contractors, indicate that the industry has plenty of capacity to handle today's volume of construction. And much of contractors' equipment, having been bought since the war, is relatively new.

FINANCING PROSPECTS BRIGHT

As the construction industry went into 1950, its prospects for financing new work were strong.

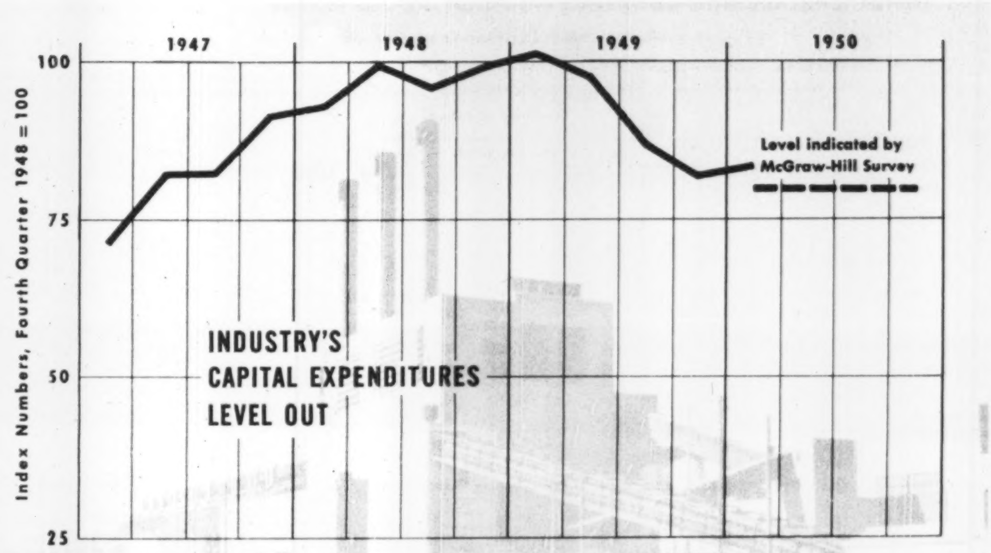
An accompanying chart shows the flow of the nation's engineering construction dollar in 1949. As things stand, a similar chart made at the end of 1950 is likely to show a higher proportion of the dollar coming from public sources and a smaller part from private.

Federally-financed work of all kinds will gain an estimated 19% in 1950. State and locally-financed projects will be up slightly less, by today's estimates. Together the two are likely to gain 14% or more. The share of this work expected to be engineering construction and reported among ENR contract awards may rise slightly more, by 16% or so.

Here are the highlights of the financing prospect:

1. State and local bond issues—which in past years have equalled about 80% of state and local contract awards—actually ran neck-and-neck with awards in 1949. Bond issues, as recorded by *Engineering News-Record,* totalled slightly more than $3 billion. Contract awards ran to $3.1 billion. Since a part of 1949's contracts was financed by tax revenues, these governments have a reserve of funds from borrowing to use in 1950. In addition, prospects are that bond sales will continue through the year at a high level. By all the indications, state and local government construction will stay at a high level, and there will be little difficulty in financing it.

2. Capital expenditures by private industry, as



INDUSTRY'S CAPITAL EXPENDITURES LEVEL OUT

Source: U. S. Department of Commerce data through first quarter 1950, adjusted for seasonal variation by McGraw-Hill Department of Economics

planned for 1950, will be 13% lower than in 1949, according to the third annual survey of plans for plant and equipment purchases done by McGraw-Hill's Department of Economics. Utility companies plan to invest almost as much as in 1949, but railroads will be off more than 44%. Among manufacturing industries only the auto companies plan higher capital expenditures – 31%. The survey did not include expenditures by commercial businesses.

Industry's investment in plant and equipment in the first quarter of 1950 was running at a level about 15% below the 1949 average. That, coupled with results of the McGraw-Hill survey of plans for 1950 as a whole, suggests that industrial investment will be relatively stable through the year. As a result, construction of plant buildings may well hold at a high level, although somewhat under 1949.

3. The mortgage money market eased markedly during 1949 and promises an ample supply of funds during 1950. Private builders, including homebuilders, are not expected to have difficulty financing new work in most parts of the country.

Dominating the financial picture for a major share of all kinds of construction is the federal government. Going into 1950, the federal government was insuring or guaranteeing almost half of all the new homes under construction. In rental housing, the proportion was even sharper – about 70%.

U.S. EASES MORTGAGE MARKET

In addition, the federal government eases pressure on the money market by buying existing mortgages from lenders. During the 1949-50 fiscal year, the Federal National Mortgage Association will invest an estimated $940 million in mortgages purchased from private lenders. That increases the market's capacity to make new mortgages and eases one of the potential limits on housing credit.

Finally, there seems to be no question but that it will be comparatively easy to finance the new public housing program. Bankers expect the bonds issued by local housing authorities will meet a ready acceptance. The fact that the federal government participates in the program, and subsidizes operating costs of the projects, makes the bonds attractive.

In short, homebuilding – which accounts for roughly one-third of all construction – is moving ahead with the support of federal programs. Public work other than residential, which adds up to almost another third of all construction, has strong financial prospects. Investment markets are strong, state and local tax revenues are at a high level. The federal

WHERE ENGINEERING CONSTRUCTION CONTRACTS WERE AWARDED IN 1949

As Reported to Engineering News-Record

Included are construction projects of the following costs or *larger* — waterworks, excavation, and irrigation, $28,000; other public works, $50,000; industrial buildings, $68,000, and other buildings, $250,000.

In millions of dollars

STATES	Total Construction	Total Public Works	PUBLIC WORKS CONTRACTS									PRIVATE CONTRACTS				
								BUILDINGS						COMMERCIAL BUILDINGS		
			Water Works	Sewerage	Bridges	Earthwork Irrigation-Drainage	Streets and Roads	Residential	Other	Unclassified	Federal Government Work	Total Private Work	Industrial Buildings	Residential	Other	Unclassified†
UNITED STATES	8157.4	4295.2	207.2	277.2	345.0	524.2	897.2	367.5	1368.2	308.7	1184.7	3862.2	950.0	1833.1	573.0	506.1
NEW ENGLAND	391.2	242.8	9.6	16.9	18.0	7.8	31.2	86.2	59.5	13.4	15.6	148.4	38.6	51.1	31.4	27.3
Connecticut	125.0	68.1	1.9	5.6	9.5	4.7	7.5	13.3	23.7	1.8	5.6	56.9	8.0	33.0	13.7	2.2
Maine	17.0	9.1	0.3	–	1.8	0.1	4.5	–	2.2	0.1	0.6	7.9	–	–	0.4	7.6
Massachusetts	201.0	143.7	6.6	5.2	5.9	2.7	15.2	72.6	27.4	8.2	3.0	57.3	28.5	13.4	14.1	1.3
New Hampshire	6.6	5.1	0.1	*	0.4	0.1	2.0	0.3	2.1	0.1	1.5	1.5	–	0.6	0.8	0.1
Rhode Island	22.8	14.4	0.2	6.1	0.2	0.2	0.9	–	3.6	3.3	4.7	8.5	2.0	3.8	2.5	0.1
Vermont	18.8	2.4	0.5	0.1	0.1	*	1.2	–	0.5	*	0.1	16.3	–	0.3	–	16.0
MIDDLE ATLANTIC	2068.4	1108.3	60.4	85.2	168.9	45.9	202.7	176.4	304.6	64.3	137.2	960.1	155.6	635.1	161.5	8.0
Delaware	62.0	11.1	0.1	0.1	7.3	*	1.4	0.4	1.6	0.2	1.0	50.9	30.9	13.0	7.0	0.1
Dist. of Col.	70.0	46.3	0.2	2.9	0.2	–	0.5	1.3	40.4	0.8	38.8	23.7	1.0	17.6	5.2	–
Maryland	206.7	146.3	6.3	4.5	47.1	2.2	32.6	3.1	44.3	6.1	31.8	60.4	10.4	39.2	8.0	2.8
New Jersey	240.4	80.1	0.6	12.9	24.6	3.4	13.2	1.5	15.2	8.8	9.1	160.3	11.8	142.7	5.8	–
New York	839.6	553.7	46.4	52.6	58.4	5.7	59.6	163.9	136.3	30.9	17.0	285.8	15.7	203.7	65.5	1.0
Pennsylvania	649.8	270.8	6.9	12.2	31.3	34.6	95.3	6.2	66.7	17.6	39.5	379.0	85.8	218.9	70.1	4.1
SOUTH	1365.1	845.1	30.0	27.7	48.1	84.2	172.9	29.4	417.4	35.4	376.5	520.0	108.8	246.3	83.8	81.0
Alabama	96.5	40.3	2.2	1.4	2.3	1.1	9.1	1.9	16.8	5.5	9.3	56.2	10.3	47.1	6.9	4.8
Florida	166.8	60.3	3.8	8.9	4.0	11.3	10.3	3.3	15.2	3.5	14.1	106.5	23.5	62.2	11.9	8.9
Georgia	111.6	42.5	2.1	2.2	4.6	5.3	13.4	1.7	9.9	3.3	9.1	69.1	10.3	47.1	6.9	4.8
Kentucky	111.0	87.9	2.4	2.0	6.0	16.7	35.9	2.8	21.2	1.0	25.4	23.0	5.8	5.5	2.1	9.6
Louisiana	144.0	88.9	1.9	4.9	8.2	21.3	19.4	0.6	27.1	5.6	26.5	55.1	11.2	23.1	11.5	9.3
Mississippi	58.3	26.9	0.3	0.5	1.6	4.5	7.1	0.8	10.3	1.9	6.0	31.5	7.8	6.7	3.8	13.1
No. Carolina	115.0	63.0	6.3	1.4	3.7	0.7	22.5	4.3	21.8	2.3	3.2	52.0	5.1	32.8	8.9	5.2
So. Carolina	64.0	32.6	3.6	2.4	1.0	5.1	14.4	–	5.4	0.9	6.7	31.4	8.2	18.9	2.6	1.6
Tennessee	361.9	296.7	2.0	0.4	3.1	4.0	16.7	6.9	259.4	4.4	250.3	65.2	12.4	18.7	11.9	22.3
Virginia	104.0	80.8	5.1	2.4	11.0	10.8	14.5	6.7	24.3	6.1	20.7	23.2	4.5	7.2	10.1	1.4
West Virginia	31.9	25.2	0.5	1.4	2.6	3.4	9.6	0.7	6.2	1.0	5.3	6.7	4.5	–	2.2	–
MIDDLE WEST	1046.2	444.4	21.4	39.9	30.0	24.2	109.2	22.9	171.3	25.4	63.4	601.8	208.8	242.2	99.0	51,8
Illinois	384.1	165.7	3.2	20.7	10.8	16.7	35.3	9.8	57.4	11.8	26.5	218.3	73.5	73.5	49.0	22.3
Indiana	85.5	42.5	1.6	5.1	4.2	2.2	4.0	4.6	20.0	0.9	10.1	43.0	22.9	10.3	7.0	2.8
Michigan	94.1	53.8	5.2	1.1	5.8	0.7	14.2	1.1	21.3	4.4	10.6	40.3	22.8	5.2	11.9	0.3
Ohio	346.8	108.4	9.5	7.5	5.4	4.3	29.8	2.1	44.1	5.5	7.3	238.5	57.8	143.7	21.2	15.7
Wisconsin	135.7	73.9	1.8	5.5	3.9	0.3	25.9	5.3	28.6	2.8	8.9	61.7	31.6	9.5	9.9	10.7
WEST OF MISS.	2097.7	958.4	41.0	44.5	49.7	185.6	263.2	42.5	239.5	92.5	321.8	1139.3	259.3	450.1	153.2	276.8
Arkansas	64.2	29.3	1.2	1.4	3.1	6.5	9.3	1.0	5.7	1.1	7.4	34.9	20.6	2.7	2.1	9.6
Colorado	64.7	50.9	0.6	3.2	0.4	8.1	14.7	0.3	12.7	11.1	21.0	13.8	5.2	2.2	3.9	2.4
Iowa	110.8	69.9	2.3	3.2	8.4	3.7	24.8	1.0	24.7	1.8	12.4	40.8	8.4	5.8	4.6	22.0
Kansas	105.7	66.5	2.7	2.4	3.9	16.9	20.7	1.6	17.2	1.1	19.4	39.2	6.6	7.3	4.9	20.4
Minnesota	117.9	54.1	1.5	3.2	4.7	2.4	16.4	–	22.8	3.1	3.0	63.8	12.7	23.0	11.0	17.0
Missouri	137.2	60.6	1.1	3.5	9.3	6.2	18.6	1.8	18.6	1.6	15.2	76.6	11.6	27.9	13.9	23.7
Montana	58.5	37.8	0.3	0.7	2.8	14.2	9.2	0.4	7.8	2.4	18.4	20.7	1.1	6.1	4.1	9.5
Nebraska	76.7	40.6	0.7	4.1	1.5	8.9	8.4	0.5	6.7	9.9	14.0	36.1	2.8	12.6	1.8	18.9
New Mexico	79.8	67.2	1.1	1.8	–	1.4	9.1	15.6	29.3	8.7	53.6	12.7	0.8	0.6	0.9	10.4
North Dakota	82.7	62.1	1.4	1.4	1.1	42.8	10.0	0.1	4.8	0.4	44.5	20.6	1.9	1.0	2.2	15.5
Oklahoma	95.5	59.4	4.0	1.7	4.6	7.3	25.1	0.5	11.1	5.2	10.5	36.2	11.9	3.5	10.7	10.0
South Dakota	86.3	62.0	0.8	0.9	0.4	45.5	8.1	1.1	2.2	3.0	49.0	24.3	2.1	1.2	0.3	20.8
Texas	996.2	285.2	22.9	17.0	8.6	20.5	82.2	18.5	73.7	41.7	49.4	711.0	170.5	356.0	91.6	92.9
Wyoming	21.5	12.7	0.2	0.1	0.9	1.3	6.6	–	2.0	1.7	4.0	8.7	3.0	0.3	1.1	4.4
FAR WEST	1188.8	696.2	44.8	63.0	30.2	176.5	118.0	10.0	176.0	77.6	270.3	492.7	179.0	208.3	44.2	61.3
Arizona	46.8	26.2	1.6	0.2	1.3	5.3	6.3	–	7.6	4.0	12.6	20.6	–	1.9	1.3	17.4
California	748.0	370.7	38.0	47.3	12.6	74.6	53.4	4.7	102.9	37.1	98.0	377.3	153.7	170.4	26.0	27.3
Idaho	33.4	25.2	0.3	0.8	2.3	3.0	7.4	1.4	8.7	1.3	10.0	8.2	1.9	–	0.3	6.0
Nevada	20.3	14.8	*	1.0	0.1	1.8	4.8	0.3	4.8	2.0	5.6	5.5	0.2	5.3	–	–
Oregon	129.7	112.6	1.0	7.0	6.1	54.9	14.9	1.1	16.2	11.5	72.9	17.1	3.6	8.5	3.2	1.8
Utah	43.8	20.4	1.0	1.6	0.2	5.4	6.0	0.4	5.3	0.6	6.4	23.4	11.9	2.9	3.6	5.0
Washington	166.8	126.3	2.9	5.0	7.6	31.6	25.4	2.0	30.6	21.2	64.8	40.5	7.6	19.3	9.8	3.7
CANADA	614.1	307.2	15.3	10.5	6.8	7.8	34.8	50.6	124.4	57.0	57.9	306.9	121.3	84.1	46.2	55.3

† Includes Private bridges. * Less than 50,000 dollars. Note: Detail will not necessarily add to totals because of rounding.

STATES RAISE HIGHWAY BUDGETS FOR 1950

Reported to Engineering News-Record by State Highway Executives

STATES	MILEAGE BUILT, 1949					Bridges	EXPENDITURES, 1949 — BUDGET FOR 1950 (Millions of Dollars)									
	Total	Hard Surface	Other Bituminous	Gravel Stone & Soil Surfaced	Graded and Drained	Number of Structures	Total Construction and Maintenance		New Contracts Awarded		Maintenance				New Equipment	
											By State		By Contract			
							1949	1950	1949	1950	1949	1950	1949	1950	1949	1950
NEW ENGLAND	606.3	161.8	435.5	4.0	–	162	91.4	139.5	59.0	108.0	31.4	30.2	1.0	1.3	2.0	1.9
Connecticut	54.0	39.0	10.0	–	–	21	17.6	15.2	11.9	10.0	5.7	5.0	0.1	0.2	0.5	0.5
Maine	336.0	23.4	312.6	–	–	69	17.3	16.8	9.9	9.5	7.0	6.9	0.3	0.4	0.2	0.2
Massachusetts F	57.0	57.0	–	–	–	26	36.4	88.2	26.9	78.6[1]	8.9	8.9	0.6	0.8	0.9	0.8
New Hampshire	70.4	7.7	58.9	3.8	–	30	6.4	8.4	2.4	4.4	4.0	4.0	–	–	0.3	0.3
Rhode Island	16.5	13.4	3.1	–	–	5	4.9	4.7	3.0	2.5	1.9	2.2	–	–	0.1	0.1
Vermont	72.4	21.3	50.9	0.2	–	11	8.8	6.2	4.9	3.0	3.9	3.2	–	–	0.1	0.1
MIDDLE ATLANTIC	2534.4	1345.0	752.8	374.9	61.7	630	340.0	403.7	272.0	332.3	63.7	70.0	4.2	1.5	5.3	6.3
Delaware	73.3	50.7	22.6	–	–	4	3.6	6.9	2.1	5.0	1.3	1.6	0.2	0.3	0.1	0.1
Dist. of Col.	36.3	20.3	13.9	–	2.1	–	5.0	6.0	3.1	4.0	1.5	1.5	0.4	0.5	0.1	0.1
Maryland	281.3	247.2	18.4	13.8	1.9	20	56.5	46.1	50.6	40.0[1]	5.3	5.5[1]	0.6	0.6[1]	0.7	0.7
New Jersey F	45.8	34.4	–	–	11.4	23	36.0	36.8	28.1	28.3	7.7	8.3	0.2	0.2	0.8	0.7
New York	585.7	404.4	143.9	14.1	23.3	83	121.5	166.0	97.0	140.0	21.7	26.0	2.8	N.A.	0.7	0.8
Pennsylvania	1512.0	588.0	554.0	377.0	23.0	500	117.4	142.0	91.0	115.0	26.4	27.0	–	–	2.9	4.0
SOUTH																
Alabama	1760.0	4.0	1408.0	98.0	259.0	77	16.0	17.5	10.9[2]	12.5[2]	5.2	5.0	–	–	1.1	1.0
Florida	233.0	200.0	–	–	33.0	53	22.2	53.3	14.4	45.6	6.8	6.5	0.9	1.2	0.5	0.5
Georgia	1002.0	83.0	552.0	108.0	259.0	131	27.4	41.0	21.7	35.0	5.7	6.0	–	–	0.9	0.6
Kentucky	2574.5	591.9	789.9	1183.5	9.3	45	45.4	50.0	35.2	38.0	9.8	11.5	0.4	0.5	2.5	1.5
Louisiana	495.4	52.3	404.9	36.2	2.0	21	38.9	40.3	26.4	28.1	11.9	11.2	0.7	1.0	1.2	1.0
Mississippi	294.6	51.9	82.3	92.2	68.2	77	11.6	4.0	7.8	–	3.8	4.0	–	–	0.6	0.5
No. Carolina	1690.0	967.0	575.0	54.0	94.0	2519	63.4	97.0	24.5	35.0	38.9[3]	62.0[4]	–	–	7.0	3.0
So. Carolina	1315.0	27.0	1288.0	–	–	99	24.6	23.0	16.6	15.0	7.0	7.0	1.0[5]	1.0[5]	1.0	0.6
Tennessee	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Virginia	832.0	97.0	647.0	83.0	5.0	240	34.3	39.3	15.8	20.0	15.5	16.0	3.0	3.3	0.7	0.8
West Virginia	1736.1	253.5	1158.4	304.3	19.9	129	27.8	27.0	13.9	14.0	13.9	13.0	–	–	6.5	2.0
MIDDLE WEST	7242.8	3978.0	2025.2	1000.6	239.0	269	187.7	322.8	123.9	163.5	48.7	53.7	15.1	15.6	3.5	5.4
Illinois	756.0	351.0	306.0	71.0	28.0	50	47.5	35.3	34.2	18.5	12.7	16.2	0.6	0.5	0.5	2.3
Indiana	127.1	72.6	52.6	1.9	–	27	14.7	29.8	7.6	22.0	6.2	7.0	0.8	0.8	1.0	1.0
Michigan	782.7	377.4	234.6	90.7	80.0	30	42.3	38.3	30.5	25.0	4.4	4.9	7.4	8.4	0.4	0.7
Ohio	3529.0	2873.0	420.0	236.0	–	84	44.4	91.8	22.7	70.0	16.3	16.3	5.5	5.5	1.6	1.5
Wisconsin	2048.0	304.0	1012.0	601.0	131.0	78	38.8	37.7	29.0	28.0	9.1[6]	9.4[6]	0.7	0.4	–	–
WEST OF MISS.																
Arkansas	650,7	32.7	401.9	164.7	51.4	[7]	N.A.	N.A.	16.2	N.A.	6.0	N.A.	–	N.A.	1.1	N.A.
Colorado	299.0	4.0	223.0	72.0	–	N.A.	17.8	20.3	15.0[8]	17.6	2.8	2.7	–	–	0.3[8]	0.8
Iowa	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Kansas	2266.7	138.7	676.9	1051.9	389.9	120	31.1	33.5	23.0	25.0	6.2	6.5	2.0	2.0	0.7	0.8
Minnesota	1111.0	45.0	581.0	132.0	353.0	31[9]	27.2	31.6	16.0	20.0	9.7	10.0	1.5	1.5	0.6	0.6
Missouri	1513.0	202.0	457.0	780.0	74.0	116	38.9	27.9	27.4	16.0[10]	11.5	11.9	–	–	1.1	1.0
Montana	427.5	1.5	233.7	119.6	72.7	36	15.2	21.5	9.8	16.0	5.3	5.0	0.1	0.5	0.2	0.4
Nebraska	484.5	27.8	127.3	164.1	165.3	46	14.7	22.0	7.0	15.0	7.7	7.0	–	–	0.5	0.5
New Mexico F	250.6	–	208.5	35.5	6.6	4[11]	10.5	16.9	7.6[12]	12.5	2.5[13]	3.4	0.4[13]	1.0	0.7[13]	N.A.
North Dakota	727.0	223.0	–	189.0	315.0	21	12.9	13.6	9.8	10.0	3.1	3.6	–	–	0.4	0.3
Oklahoma	1339.9	163.5	432.9	633.1	110.4	203	25.4	N.A.	10.7	N.A.	0.8	N.A.	0.7	N.A.	N.A.	N.A.
South Dakota	498.0	81.0	222.0	99.0	96.0	8	9.4	8.6	6.7	7.2	2.0	.0.7	0.6	0.8	0.8	0.6
Texas	3222.2	2387.3	558.3	55.8	220.8	382	103.5	97.0	83.2	75.0	20.3	22.0	–	–	2.4	2.0
Wyoming	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	9.0[14]	N.A.	2.5	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
FAR WEST																
Arizona	246.0	1.0	190.0	14.0	41.0	70	9.8	9.1	8.1	7.5	1.7	1.6	–	–	0.3	0.3
California	867.4	508.3	173.4	–	185.7	117	86.5	92.4	68.2[15]	72.4[15]	17.8	20.0	0.5	N.A.	2.6	3.0
Idaho	462.0	–	320.0	138.0	4.0	16	10.0	12.0	7.0	9.0	3.0	3.0	–	–	0.2	0.2
Nevada	237.0	–	198.0	39.0	–	4[16]	5.9	7.4	4.1	5.8	1.8	1.6	–	–	0.1	0.3
Oregon	575.0	62.0	184.0	179.0	150.0	32	24.8	25.1	13.4	15.0	10.4	9.8	1.0	0.4	1.1	1.2
Utah	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Washington	951.0	72.0	664.0	167.0	48.0	49	33.2	37.2	25.9	30.0	6.9	6.5	0.5	0.8	0.9	0.8

Note: Detail will not necessarily add to totals because of rounding

F—Fiscal Year

N.A.—Not Available

[1] estimated for 1950

[2] includes county aid projects

[3] includes $17,384 construction

[4] includes $40,000 construction

[5] bituminous retreatment

[6] done by counties, paid by state

[7] 17,724 linear feet

[8] estimated from budget

[9] 24 new, 7 widened

[10] unless more state revenue is provided

[11] includes 2 overpasses

[12] includes only funds spent on construction contracts

[13] fiscal July 1, 1948 to June 30, 1949

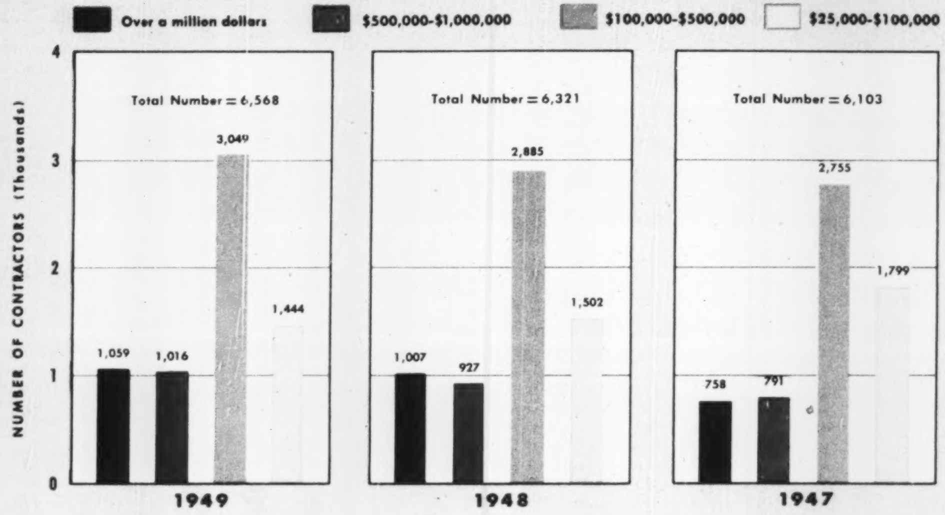
[14] includes $1,000,000 co-op system by counties

[15] includes federal aid secondary projects not on state highway system

[16] 2 new, 2 concrete decks

MORE CONTRACTORS ENTER THE FIELD

Number of Contractors by Volume of New Contracts Reported



government's spending on its own projects and its aid to state and local projects are scheduled to reach new peaks during the year.

With general business now at a high level, and employment and personal incomes expected to stay high through the year, there is nothing in sight to suggest trouble in financing the volume of private non-residential building expected this year. Generally, construction's financial base is strong.

THE OUTLOOK IN BRIEF

To put all this into brief summary, the prospects are that 1950 will see:

New construction of all kinds at the 1949 level – and perhaps slightly above it.

Engineering construction – as measured by ENR's contract awards – gain 5% or more to top $8.5 billion.

Wage rates and material costs fairly stable. Better efficiency, however, can bring down prices to buyers.

Strong competition in the materials and equipment fields.

Adequate financing for the volume of public and private work expected.

ENGINEERS HANDLED MORE PROJECTS WITHOUT GENERAL CONTRACTORS

WITH general contractors . . .

Size Groups	1948	1949	% Change
Over $1,000.000	4,212	3,860	−8
$500,000 to 1,000,000	2,427	2,427	−1
$100,000 to 500,000	4,496	4,462	−1
$ 25,000 to $100,000	1,392	1,385	−1
Amount not reported	148	87	−41
TOTAL	12,695	12,221	−4

WITHOUT general contractors . . .

Size Groups	1948	1949	% Change
Over $1,000,000	479	654	+37
$500,000 to 1,000,000	360	478	+33
$100,000 to 500,000	1,014	1,182	+17
$ 25,000 to $100,000	279	367	+32
Amount not reported	53	30	−43
TOTAL	2,185	2,711	+24

1949-50 ANNUAL REPORT ON

Techniques and Trends

AN EDITORIAL SURVEY OF PRACTICES AND PROJECTS

Much happened in 1949 that augurs well for 1950. The broad economic factors—costs, availability of capital, backlogs of projects, wages, materials and equipment situations—were analyzed in the preceding section. In the pages that follow technology is the topic—and those developments in each field of civil engineering and construction that denote progress and determine trends.

For the first time since the war the construction industry became truly competitive. Availability of materials and general freedom from strikes gave everyone an even chance. High cost levels added an incentive for economy and efficiency. Ingenuity to improve old methods and develop new ones came back into fashion. Engineers tried it on their drawing boards, contractors tested its advantages on their jobs.

Enlarged programs of work also helped to create the necessary atmosphere for progress. Drives for stream pollution abatement sparked new processes for industrial waste treatment. Booming residential building and population shifts focused attention on water supply—many new projects were begun, and the federal government even started a serious research program on the old problem of removing salt from sea water. Under the pressure of inadequate highways, large toll road projects were undertaken. Long span bridges began to appear once again, and tall office buildings and apartment houses rose to change city skylines. Flood control and irrigation programs were at all-time peaks. And such words as fly ash, pumice, vermiculite, stainless steel, aluminum, prestressing and sand piles assumed new importance in engineering and construction practice.

These are trends and developments that portray construction in its true dynamic character. They are continuing into 1950. For the full story of what they are and what they mean, turn the page where the first of the four chapters listed below begins.

Building and Housing 98

Transportation 108

Water Supply and Sanitation 119

River Development 133

Buildings and Housing

THERE ARE STRONG REASONS to believe that 1949 and 1950 in the field of buildings and housing will be alike—both good. Volume-wise, 1949 was a record year in housing. Apartment building was notably active. Commercial buildings included more skyscrapers than for many years, and exceeded 1948 volume. Public buildings likewise were up, dominated by schools and hospitals. Only industrial building fell behind former records, but remained at high level nevertheless.

Technologically, a more progressive trend is to be noted than at any time since the war. Expressed in code revisions, stepped-up research, lighter weight wall designs and ingenious attempts at cost cutting, this trend is continuing in 1950.

Housing Sets All-Time Record

MORE NEW HOUSES were put under construction in 1949 than in any previous year. Starts totaled 1,023,000, according to the Bureau of Labor Statistics, topping the previous record of 937,000 set in 1925. It is also significant to note that more new houses (40,000 more) were built during the last three years than in the 1923-25 period, when the previous record of 2,700,000 starts on privately-financed, non-farm units was established.

New highs were also set for prefabricated houses. Manufacturers shipped 35,000 wood units in 1949, 5,000 more than in the previous year. Metal prefabs totaled 2,500 units by the year's end.

The Federal Housing Administration announced that all its previous records were broken. The 783,800 applications received were one-third greater than in 1948. Starts reached 361,450—about 24% above 1948—and accounted for 36.8% of privately financed, nonfarm units. Completions totaled 315,000—11% above 1948's all-time high. And mortgages and loans insured in 1949 were secured by 448,600 units, of which 70% were new.

The housing boom, in fact, may be attributed primarily to government aid in the form of insured mortgages and building loans. Contributing also was the general prosperity of the country, improved quality of new houses and lowered selling prices.

The Housing Act of 1949

NOT CONTENT with the efforts of private enterprise to house the nation, Congress passed the Housing Act of 1949. Title I of this act authorized the Housing and Home Finance Agency to make loans and grants to assist locally initiated, planned and managed slum clearance and urban redevelopment. Loans up to $1 billion may be made over a 5-year period to finance the planning of local projects and to acquire and prepare land for re-use. Capital grants up to $500 million may be made over a 5-year period to help meet the

MANHATTAN HOUSE, being built in New York City for the New York Life Insurance Co., has a reinforced concrete frame and brick walls. To be completed in October, it is 27 stories high and contains 582 apartments. Nearby, the company is building an 850-car garage. Last year, N. Y. Life completed its 3,000-apartment Fresh Meadows development in Queens.

GLEN OAKS VILLAGE, second part of a 3,000-family development on 175 acres in Queens, N. Y., was completed by the Gross-Morton Co. last fall. The first section, 576 units, was finished in 1948. A shopping center will be completed soon.

loss involved in slum clearance by the local authorities.

Title II temporarily extends some of FHA's mortgage insurance operations.

Title III amends the Housing Act of 1937 by authorizing contributions and loans for local programs to add 810,000 low-rent public-housing units over a 6-year period. Contributions up to $308 million per year may be made to make up the difference between annual rents and annual costs for these units. However, costs of construction and equipment is limited to $1,750 per room, with an increase to $2,500 permitted where necessary.

Title IV authorizes the HHFA to conduct research aimed at reducing housing costs.

Title V authorizes loans for farm housing and Title VI provides for a decennial census of housing.

Under this bill, construction contracts amounting to almost $5 billion may be signed by local authorities during the next six years. And if full use is made of authorized federal assistance, the resulting government expenditures could support local spending in excess of $6.8 billion.

Despite these substantial aids, public housing proponents argued that 810,000 units in six years would not be adequate to solve the housing shortage. Private home builders replied that public housing in such volume would cause curtailment of private construction. On the plus side again, some economists figured construction stood to gain a great deal from the program: Good-quality public housing adjacent to substandard structures may lead to rebuilding of the run-down districts. And where the new buildings are erected, there will be a demand for new schools, new commercial buildings and new streets. Thus, these economists visualize the federal program as providing a backlog of construction that will cushion the effects of a business setback.

By Dec. 31, about 500 communities had applied to the Public Housing Administration for federal aid under the low-rent housing program, and President Truman had approved preliminary loans totaling $35,801,000 to 227 localities. These communities report intentions to build 221,391 units to accommodate more than 800,000 people now living in substandard dwellings.

A $30,000,000 Question

DURING 1949, Congress also passed the Wherry Act, which permits private builders to do work on U. S. property, with FHA or Reconstruction Finance Corp. backing. However the legislators balked at authorizing another $25,000,000 for prefabricated houses. Presumably, a large proportion of this money would have gone to the Lustron Corp., manufacturer of prefabricated porcelain-enameled steel houses, to which the government—through the RFC— had already lent $37,500,000, starting back in November, 1946.

Lustron, although it had the capacity to produce 2,200 houses monthly, had at the year's end shipped only 1,970 in all. Claiming a shortage of working capital, Lustron sought and was denied a further RFC loan, and in February 1950 RFC foreclosed the mortgage that it held.

Both RFC and the company agree that the government stands to lose $30,000,000 in this enterprise. And what may be of even greater significance, the stigma of this failure may prove to be a blow dealt to prefabrication from which it may take a long time to recover.

The Lustron Corp. was trying to revolutionize housebuilding: In its factory, it was going to turn out steel parts that could be rapidly assembled on a site to form a complete dwelling. But it quickly ran into price troubles. A house costs a dealer $6,000 at the plant gate, but by the time it has been erected the price runs from $9,000 up. In this range, there is stiff competition from conventional builders. Dealer financing was also a stumbling block, for they had to carry the cost from the time a house left the plant until it was erected and sold.

Lustron can now be added to the long list of would-be prefabricators who have discovered the hard way that mass production methods alone do not guarantee low-cost construction. Prefabrication substitutes for the disadvantages of on-site construction the possibility of high-efficiency shop fabrication, but introduces handling, packaging, transportation, distribution, financing and assembly problems. It is not enough to fabricate components economically; every operation must be low-cost.

More Housing Aids Considered

THOUGH CONGRESS IS RELUCTANT about providing more funds to promote prefabrication, it still sees a need for assisting house builders. Now under consideration is administration-backed legislation for a $2.2 billion housing program designed to provide more than 250,000 units for middle-income families through cooperatives and other non-profit organizations. If this bill is passed, the government would guarantee mortgage loans for 95 or 100% of development costs. Interest rates would be about 3%, and 50 years would be allowed for repayment. This legislation will probably be superimposed upon the omnibus Sparkman bill now on the Senate calendar, which proposes $4.5 billion in federal insurance and loans to aid private building.

Boom Spurs Mass Production

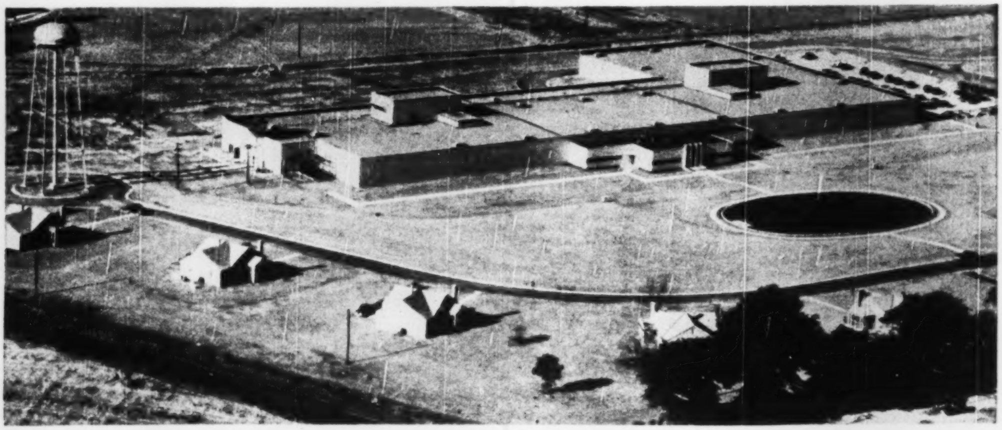
THE BOOM has had an effect on building technology that is quite significant. It has created a trend toward on-site mass production, not only among large-scale operators but also among small builders. One example of the use of mass production methods is Levittown, near Hempstead, L. I., a 6,000-house development. Crews of men move from house to house, each group repeating the same standardized operation on every unit, from digging foundations to painting. One man may do nothing more than fix bolts in the floor for installing a washing machine. Framing is delivered precut and plumbing pre-assembled. On the average, Levitt & Sons, the builders, turn out a 2-bedroom, wood-frame bungalow every 16 min. It sells for $7,990—quite low for housing in the New York Metropolitan area.

Another example is a project in Norfolk, Va., where Ibec Housing Corp. is erecting two-bedroom concrete houses at the rate of two a day by a novel method. A steel form for the exterior and interior walls of an entire house is placed as a single unit on the floor slab. Concreting of all walls and partitions may be done in about one hour. The concrete is allowed to set overnight. First thing the next morning, the form is stripped and moved to a new site. A precast roof slab is placed on top, windows and doors inserted, and then finishing operations, like painting and installation of electric wiring and plumbing, complete the job.

Other Building Stays High

OTHER FACTORS than large volume of construction were important in setting trends in non-residential building. No important records for volume were broken in 1949. Nevertheless, the totals are impressive, commercial and public building exceeding 1948 volume, and industrial building dropping only 12% below its 1948 high.

To keep up with the geographical shifts caused by



JOHNSTON MILLS, a $3,000,000 weaving plant at Johnston, S. C., covers 120,000 sq ft and is one of seven mills built last year for Deering, Milliken & Co., Inc., in South Carolina. Others were a $3,500,000 woolen spinning plant at McCormick; $4,000,000 rayon plant and $3,000,000 worsted-finishing plant at Pendleton; $3,000,000 rayon-tire cord plant at Clemson, and $2,500,000 rayon finishing plant at Abbeville. All were built by one contractor—Daniel Construction Co. of Greenville, S. C.

major housing developments, non-residential commercial construction will continue in high gear. And any drop that may occur will be made up by an increase in public building.

Bolstered by federal appropriations, grants and loans, public building may be expected to increase during the next few years: Only a start has been made on the $11 billion investment estimated by the Office of Education of the Federal Security Agency to be needed for new school plant and equipment; and a severe shortage still exists in hospital facilities.

To meet hospital needs, Congress has authorized $75,000,000 per year for the hospital program of the U. S. Public Health Service under the Hospital Survey and Construction Act. As of Dec. 31, 139 projects costing $35,308,000 were in operation and 523 projects costing $384,882,000 were under construction. In addition, 357 projects for $248,492,000 worth of work had received initial approval. The federal share of all these projects totals $210,339,000.

The Veterans Administration by the end of 1949 had completed 5 hospitals, providing 2,483 beds, and 33 additions containing 10,611 beds; still under construction were 44 hospitals, with 20,006 beds, and 6 additions, with 1,451 beds. For the future and now in the planning stage are facilities for some 15,000 more beds in 18 hospitals and 3 additions.

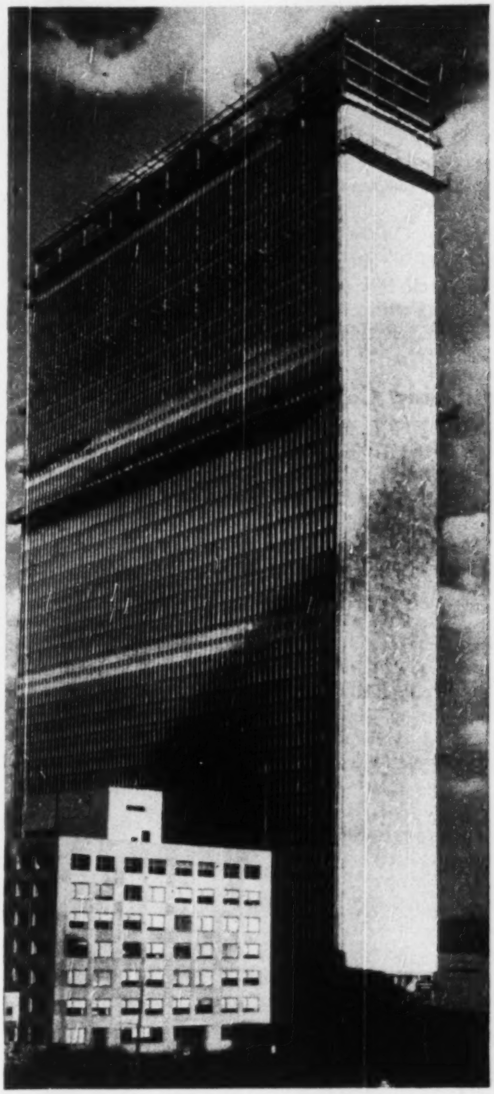
Congress also has appropriated huge sums for military buildings and for the atomic-energy plants and laboratories. Bigger, better and cheaper bombs continue to be the main objective of the Atomic Energy Commission, and plants have to be designed and constructed to build them. In the meantime, progress is being made in replacing war-built facilities, both factory and housing, with more-permanent construction and in enlarging research activities directed toward peacetime applications of atomic energy. Also, schools, hospitals and other community facilities are being constructed for the service of the government-owned atom cities of Oak Ridge, Tenn., Hanford, Wash., and Los Alamos, N. M.

In November, the AEC authorized the building of the first experimental breeder reactor. With this, the program for producing more fissionable material and for generating power for factories and ships moved from paper to full-scale test machines. This year, work may start on an intermediate power-breeder reactor, also to explore the possibility of producing electric power with neutrons. These structures may mark the origination of a new type of building—an atomic-energy power plant.

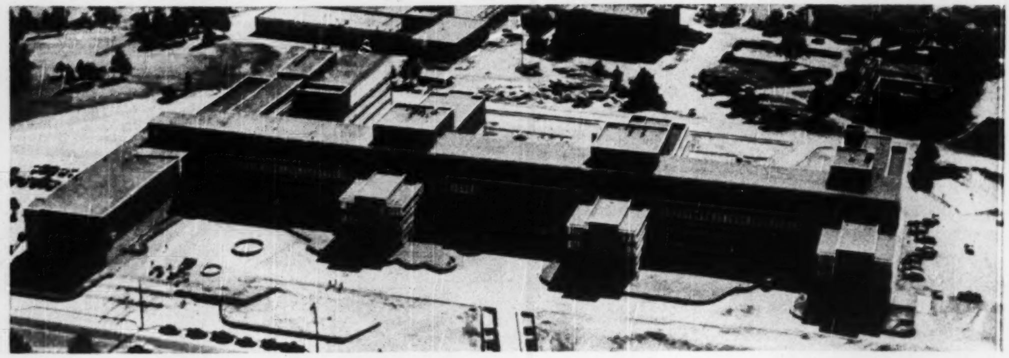
In contrast to the expected increase in public building, the outlook for private industrial building is not so bright.

Studies of industry's plans for capital expenditures in 1950 indicate that the volume of industrial building this year will continue to be high, although possibly not as high as the 1949 total. Analysis of these plans shows that manufacturing industries may be expected to replace and rebuild existing facilities in preference to expansion.

Widespread belief that construction costs are too high and that they may drop is held by many construction men to be responsible for postponement of much new building. However, there seems to be little indication that a drop in costs is possible: Wages and material prices can hardly be expected to come down; in



UN SECRETARIAT will be ready for occupancy in New York City this summer. Costing $24,000,000, it is 72x300 ft in plan, 42 stories high, air-conditioned, steel-framed. Foundations were placed for Meeting Halls and General Assembly Buildings and parking garages.



HEALTH SCIENCES BUILDING for the University of Washington was completed at a cost of $10,000,000. The structure is four stories high, of reinforced concrete construction, and contains 494,000 sq ft of floor area.

fact, they are more likely to rise. Improvements that have been brought about in the cost picture have resulted from increased efficiency of labor, elimination of contingency items from contractor's bids and smaller profits.

Building Code Progress

SOME HOPE for lowering building costs has been seen in technological improvements, but archaic building codes stand in the way in many parts of the country. Considerable progress was made in 1949 in eliminating these barriers.

Many cities, including some large ones like Chicago and Cleveland, brought their codes up to date during 1949. Most of them adopted a performance-standards type, which would not become obsolete as rapidly as the specification type. Progress also was made in several states—New York, Iowa and Illinois, for example—toward promulgating state building codes.

In November, an important step toward establishment of uniform national building regulations was taken. After 5 years of preparation, the Building Officials Conference of America approved its Basic Building Code. Proposed as a national model, it will be made available later this year to communities that wish to adopt it, after some adjustments in wording have been made.

This code is based on functional standards, but it is not a purely performance-standards code. During the transition period between abandonment of the specification-type code and adoption of the new type, some mandatory provisions had to be incorporated.

Advances in Building Technology

HIGH LABOR AND MATERIAL COSTS throughout 1949 gave builders a strong incentive to use or develop new building materials and methods. Greater use than ever was made of panel construction, precast concrete, and lightweight aggregates for concrete and plaster. A device that was reported to make it possible for a man to lay 3,000 bricks per day attracted considerable attention. And trends toward more efficient lighting, heating and air conditioning continued.

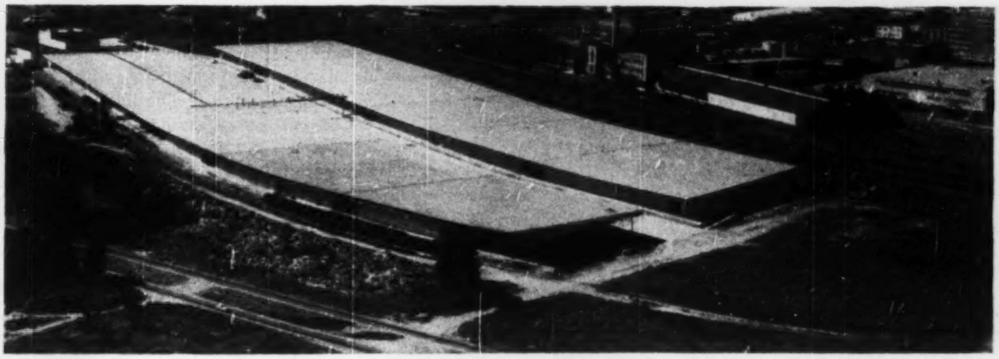
In many cities, buildings taller than those previously erected sprang up. The 30-story John Hancock Life Insurance Co. office building in Boston, for example, set a new record for New England; a 15-story apartment house in Columbia topped all others in South Carolina. And in many other cities, where height records did not topple, a great many near-record structures were erected. The reason: a large demand for office space plus high real estate costs plus availability of designers and contractors with know-how for building skyscrapers.

In many of these structures, the trend toward lighter construction was readily discernible. Some used cellular, light-gage steel panels for floor decking, with lightweight concrete fill on top; others had structural floor slabs of concrete made with a lightweight aggregate. In many cases, fireproofing consisted of plaster made with lightweight aggregates. The savings in dead weight was appreciable: 2,000 tons was shaved off the weight of structural steel in the John Hancock Building, for instance, by substituting vermiculite for sand and using steel decking.

A new height record also was set for buildings with a precast concrete frame. Near Blawnox, Pa., a four-story office building was erected in four months, the concrete members being selected from a handbook, cast in a factory, trucked to the site and raised into position with a crane—like structural steel. The cost is reported to have been substantially less than for other types of fireproof construction.

But by far the greatest use of precast concrete was in roof and wall construction. Greatest increase was in the latter, not only for industrial buildings but for other types as well, because of economy and speed of erection. In an 8-story building in Columbia, S. C., for example, $100,000 was saved by using precast walls.

In several cases, precast concrete was advantageously



ALFORD REFRIGERATED WAREHOUSES built the world's largest such warehouses at Dallas, enclosing 14,500,000 cu ft. Walls, floors and roof of the two buildings here—one for dry and one for cold storage—were built with paperbacked wire mesh.

used in combination with other materials. One type that attracted considerable attention consisted of cellular-glass insulation sandwiched between two 2-in. thick precast slabs.

The trend toward metal-faced walls continued in 1949. Use of aluminum gained: about 20% of production now goes to building, compared with 4% before the war. One of the most extensive applications of this metal during the year was for the walls and roof of the Aluminum Company of America Davenport Works. This plant, which covers 52 acres, incorporates 295,000 sq ft of cellular, aluminum panels above and between aluminum sash and 43.7 acres of aluminum roof deck.

Also at the Davenport Works, Alcoa built an office building with a new-type aluminum wall that might meet building-code requirements for skyscraper construction. The wall consisted of a 4-in. thick precast concrete panel made with diatomaceous earth as aggregate and a cast aluminum facing. It was intended for ultimate use in an office building that Alcoa is planning to erect in Pittsburgh. At latest reports, however, aluminum stampings are under consideration for the exterior of this structure.

Stainless steel entered the picture in 1949 as a suitable facing in panel construction. It was used for several buildings as the exterior of cellular panels, the interior being low-carbon steel.

Meanwhile, a relatively new trend toward buildings without walls continued. Within the past few years, this type of construction has been employed for garages all over the country. Last year, a new application was made—the Corn Products Refining Co. built ten wall-less buildings for its new plant at Corpus Christi, Tex., saved money, prevented explosion hazards.

To improve seismic design, San Francisco engineers in November proposed new code provisions for lateral forces. Most codes now contain empirical design formulas; the new earthquake formulas are based on dynamic principles, yet are practical for everyday use.

Another design development of significance was a change in the provisions for allowable loads on piles in the New York City building code. For the first time, the permissible working load is based on load tests rather than on arbitrary formulas or abstract theory. As a result, pile foundation costs can be reduced about 25%.

In 1950, code changes may be made as a result of the availability of improved reinforcing bars for concrete. Tests have shown that, because of the better grip of the new-type bars, bond is supplied along their length where it is needed, and the addition of hooks adds

BATTERY PARKING GARAGE of the Triborough Bridge and Tunnel Authority in downtown Manhattan, will have seven parking levels, for 1,050 passenger cars. Spiral ramps are in the structure in the foreground. The $3,500,000 building will be opened this summer.

little or nothing to their effectiveness. During the year, the American Society for Testing Materials set up as a standard Specification A 305-49 for minimum requirements for the deformations of reinforcing bars. It is quite probable that sometime this year the American Concrete Institute will approve higher bond stresses for bars meeting this specification than was allowed for the older type deformed bars.

Steps to Speed Progress

FASTER technological advancement may result from two actions taken in 1949: organization of the Building Research Advisory Board and congressional authorization for the HHFA to undertake research.

BRAB was established to coordinate, guide and encourage scientific and technological research in the many component fields of the building industry. Its policies and program are determined by a 27-member board made up of men from industry, government and non-profit research organizations. During its first year, BRAB established a 5-year program, studied modular coordination under a contract with the HHFA and sponsored a symposium on the effects of weather on the building industry. Its next step is to determine what urgent problems it should tackle.

HHFA, up to now, was limited only to research directed at standardization and building codes. The Housing Act of 1949, however, directs the agency to carry out a program of research concerned with the development, demonstration and promotion of new materials and methods. To carry out this aim, a Division of Housing Research is being organized.

Some Major Building and Housing Projects

ALUMINUM COMPANY OF AMERICA—The plant at Point Comfort, near Port Lavaca, Texas, designed to produce 114,000,000 lb of aluminum per year, was completed. Power will be generated by internal combustion engines using natural gas as fuel. This spring, a new rod, wire and cable mill at Vancouver, Wash., will start operation. Aluminum Ore Co., a subsidiary, completed a plant for the production of fluorides at East St. Louis, Ill.; capacity is 10,000,000 lb per year on one-shift operation.

ATOMIC ENERGY COMMISSION—Completed during 1949 and put into operation at Hanford were a new reactor to produce plutonium and a large new plant to fabricate plutonium metal. At Oak Ridge, construction started on advanced-design additions to the gaseous diffusion plant, which separates fissionable uranium 235 from non-fissionable uranium 238. Also, the 165-mile pipeline to supply natural gas for the steam-electric plant of the gaseous diffusion operation was completed. Late in 1949, preliminary construction started on the experimental breeder-reactor at the Reactor Testing Station in Idaho.

COOSA RIVER NEWSPRINT MILL—Located on a 710-acre site at Coosa River, Ala., this $32,000,000 plant was completed early in Jan. 1950. It will turn out 350 tons of newsprint a day and more than 100 tons of sulphate for paper products. The main building is 1,114x230 ft.

CORN PRODUCTS REFINING CO.—$20,000,000 plant at Corpus Christi, Texas, for processing milo maize into starch, dextrose, oil and livestock feeds went into operation last April. Many of the plant's 21 buildings have no walls or are only partly enclosed. Concrete silos provide storage space for 2,000,000 bu of grain and the plant has its own power facilities. Buildings are of steel-frame and brick construction for the most part.

E. I. duPONT de NEMOURS & CO.—$30,000,000 expansion of the experimental station near Wilmington, Del., started in 1948, is 70% complete. Some of the buildings are now in use. Underway are ten laboratory and semi-works buildings, enlargement of existing laboratories, and 13 service buildings. A long-range program for the expansion of nylon textile fiber and staple production was started in 1949; additions were built at Seaford, Del., and Chattanooga, Tenn., and a new plant at Victoria, Texas. The Sabine River Works at Orange, Texas, for manufacturing nylon intermediates, methanol, polythene, and other products, was completed. Completion is expected in August of the new plant near Camden, S. C., for the first commercial production of acrylic fiber, a new synthetic textile material. This plant and its utility buildings cover an area of 20 acres and have walls of quadruple-size brick.

FORD MOTOR CO.—Last fall, construction was started on a 1,000,000-sq ft, one-story plant near Buffalo, N. Y., to make passenger-car body parts. Full production output will be reached in two years. At the company's research and development center in Dearborn, Mich., a start was made on a 450x430-ft cross-shaped, engine-development laboratory containing 38 test rooms and offices.

FIRST NATIONAL BANK & TRUST CO.—A 20-story, $6,000,000 completely air-conditioned office building in Tulsa, Okla., will be ready for occupancy in July, 1950. Masonry work on the steel-frame, brick and marble structure was finished in December and interior work is now under way.

GENERAL ELECTRIC CO.—$30,000,000 turbine plant, covering 20 acres of land, was completed at Schenectady, N. Y. The frame is structural steel, walls insulated, cellular steel siding protected by aluminum paint. A 4-story office building at one end of the plant, containing 71,000 sq ft of floor area, has walls formed with insulated, stainless steel cellular panels. Also completed last year was a similarly constructed high-voltage engineering laboratory at Pittsfield, Mass., with 51,273 sq ft of floor area.

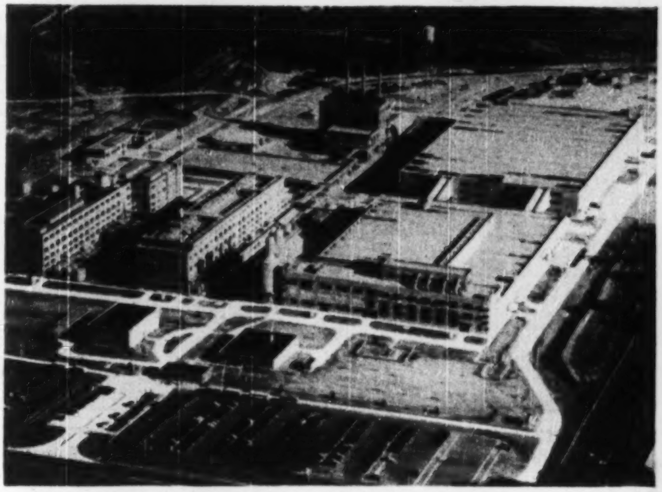
JOHN HANCOCK MUTUAL LIFE INSURANCE CO.—Home office in Boston, 30 stories high, has been completed. Air-conditioned, it is of steel-frame construction with light-gage steel floors and vermiculite plaster and concrete. Sandstone, granite and aluminum walls enclose 1,000,000 sq ft of floor area.

JOHNSON'S WAX CO.—Research Laboratory at Racine, Wis., is 154 ft high, with nine 40x40-ft main floors and six 38-ft-dia mezzanines cantilevered from a central concrete core. The exterior wall is made of horizontal glass tubing and plate glass, supported by cast aluminum stanchions. The building will be completed this fall.

LINCOLN ELECTRIC CO.—An

$8,500,000 plant in Cleveland, Ohio, for manufacturing welding equipment and electrodes, will be completed this year. The windowless 1,400x500-ft plant will have exterior walls made of insulated, aluminum-and-steel cellular panels, fastened with welded studs. The roof will be insulated steel deck on welded H-beam trusses.

METROPOLITAN LIFE INSURANCE CO.—In the rebuilding of 25 city blocks in New York City, Stuyvesant Town (8,755 apartments) and Peter Cooper Village (2,495 apartments) were completed during the first half of 1949. The buildings range in height from 12 to 15 stories, have structural steel frames and brick exteriors. Also completed was the 18-story Crowell-Collier office building. A 28-story office building—third and final unit of the home office—will be ready for accupancy this summer. These office buildings are both in New York City. In California, 13-story concrete apartment buildings are being erected to add 2,937 apartments to the 1,316 already occupied in Parklabrea, Los Angeles, and 1,796 to the 1,687 now occupied in Parkmerced, San Francisco. Rental of the new apartments will begin this year.



CELRIVER PLANT of the Celanese Corp. of America at Rock Hill, S. C., contains 1,500,000 sq ft of floor area, cost $42,000,000 including equipment.

NEW YORK CITY HOUSING AUTHORITY—Completed in 1949: Jacob Riis Houses, Astoria (Part I), Gowanus, Woodside and Lillian Wald Houses for 5,837 families at a construction cost of $41,747,484. Partly occupied: South Beach, Eastchester, Pelham Parkway, Sheepshead, Glenwood, Todt Hill, Governor Smith Houses (Part I) with 6,448 apartments, at a construction cost of $59,740,517. Started in 1949 and scheduled for occupancy in 1950: Melrose (Part I), Farragut (Part I), Sedgwick, Berry, Arverne, Boulevard, Ravenswood, Marble Hill, Parkside, Colonial Park and Lexington Houses for 11,733 families at a construction cost of $74,516,781. All have reinforced concrete frames, except the Governor Smith Houses, which have structural steel.

NORTHGATE CO.—$10,000,000 suburban shopping center north of Seattle, Wash., will be completed this summer. It consists of 11 buildings.

PACIFIC GAS & ELECTRIC—Moss Landing steam plant will be the biggest unit added to the system in 1950. It will have a 300,000-kw capacity. The structural frame for the $51,500,000 Contra Costa steam plant was nearly completed in 1949. Equipment installation will take another year. A second 100,000-kw unit was added to the Kern steam plant, which is the first of three completely new steam plants to be built by this company since the war, and a second unit (110,000-kw) was added at Station P in San Francisco.

PACIFIC STATES CAST IRON PIPE CO.—First centrifugal, cast-iron pipe plant west of the Mississippi was completed at Provo, Utah. Providing 215,000 sq ft of floor area, it can produce 100,000 tons per year and is estimated to cost $3,500,000. It consists of four mill-type, steel-frame buildings with galvanized, corrugated iron roofing and siding.

THE PARKWAY — Four 10-story apartment buildings, containing 1,744 suites and a shopping center, to cost $20,000,000, are under construction on a 22-acre site in Irvington, N. J.

PORT OF NEW YORK AUTHORITY—The $9,000,000 New York Union Motor Truck Terminal, the $7,950,000 Newark Union Motor Truck Terminal, and the $5,000,000 Federal Building—a central office building for Civil Aeronautics Administration and U. S. Weather Bureau workers at New York International Airport —have been completed. The three hangars now under construction at the airport, which will cost $9,200,000, will be finished in May. The $24,000,000 New York Union Bus Terminal started in Jan. 1949, will be completed late this year.

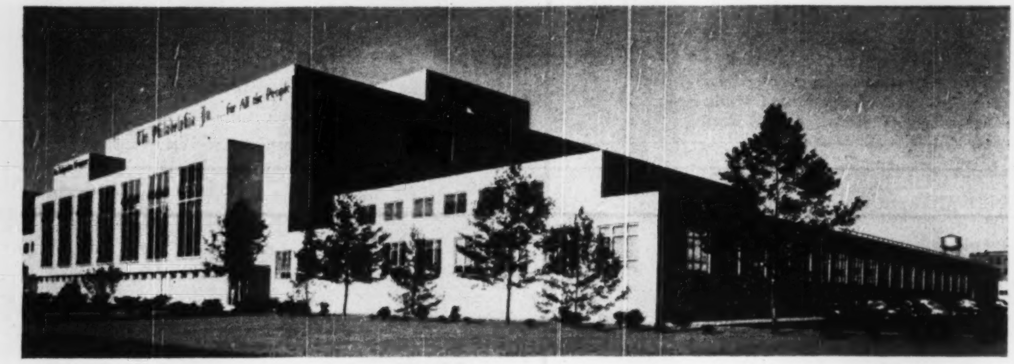
PRATT & WHITNEY AIRCRAFT —$12,000,000 jet-engine laboratory, a 6-story, 400x166-ft windowless building, is nearing completion at East Hartford, Conn.

PUBLIC BUILDINGS ADMINISTRATION—$9,381,686 contract for the Federal Courts Building for the District of Columbia, was awarded last May; the building is now 15 percent complete. The General Accounting office, being built under a $21,635,500 contract, is about 20 percent complete, having been under construction for 13 months. Erection of the superstructure of the clinical center of the National Institute of Health, at Bethesda, Md., has been started under a $16,814,200 contract awarded last September. Foundations were built under a $3,273,000 contract. Contracts mentioned do not include cost of elevators.

STONESTOWN—Only interior finish work remains to be done in this San Francisco apartment development of ten 3-story buildings and four 10-story buildings, which cost $6,000,000 and provide 683 units. Yet to be added is a $20,000,000 shopping center.

TENNESSEE VALLEY AUTHORITY—Work started last May on New Johnsonville steam plant, a $54,000,000 three-unit 337,500-kw project on Kentucky Lake in western Tennessee. The first 112,500-kw generator is scheduled to be in production by the end of 1951 and the other two within the following six months.

THE TEXAS CO. — At Westville, N. J., a 40,000-bbl per day crude refinery was completed. The existing refinery at Tulsa, Okla., was expanded and modernized to increase the capacity to 30,000 bbl per day of crude. At Port Arthur, Texas, lube-oil manu-



ROTOGRAVURE PLANT for the Philadelphia Inquirer is 353x310 ft, with 720,000 sq ft of floor space. Building has a reinforced concrete frame and limestone and brick facing. The 200x150-ft flat roof can take helicopter landings.

facturing facilities were increased by 30,500 bbl per day of crude and 2,500 bbl per day of finished lube oil. Also, research laboratories at Beacon, N. Y., were expanded.

TEXAS MEDICAL CENTER—Ground was broken in Houston, Texas, for a new Methodist Hospital—a 300-bed institution to cost about $4,000,000. A description of the project, with a list of buildings completed and planned, was published in ENR Dec. 29, 1949, p. 14.

TISHMAN REALTY & CONSTRUCTION CO. — Among the housing projects this company has under way in New York City is the $12,000,000 Sutton Terrace and a 1,000-family $10,000,000 development on a 10-acre tract in Queens. The former, in Manhattan, will provide 500 units in one 13-story and two 12-story structures facing a 35,000 sq ft garden, under which will be a 4-level garage for 300 cars.

U. S. NAVAL HOSPITAL—At St. Albans, Queens, N. Y., exterior wall construction is 80 percent complete and work on interior partitions is well under way. This contract, largest lump-sum ever awarded by the Bureau of Yards and Docks for hospital construction, calls for the erection of a $15,000,000 hospital with medical facilities for 1,000 patients. Due to the postponement of construction of two of the ward buildings, however, the bed capacity at present is 600. Seven interconnected buildings, with more than 8,250,000 cu ft, will be completed by April, 1951.

UNIVERSITY OF CALIFORNIA—The construction program calls for expenditure of $120,000,000 for the field stations and eight campuses. Almost $48,000,000 worth of projects are either completed or under construction; $50,000,000 will be bid during 1950 and $23,000,000 in 1951. Biggest single expenditure is the $21,080,000 medical center in San Francisco, the initial unit of which is under way. Other major buildings are now under construction on the Berkeley, Davis and Los Angeles campuses.

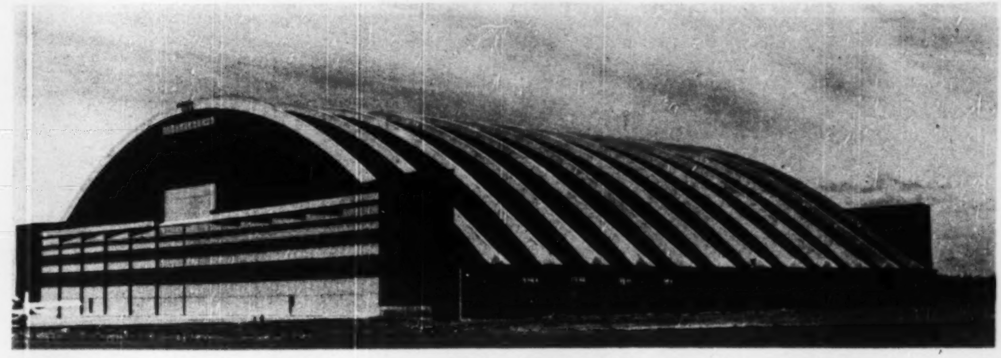
VETERANS ADMINISTRATION—In the $1 billion hospital program, 5 hospitals with 2,483 beds, and 33 additions, with 10,611 beds, have been completed. Still under construction are 44 hospitals, with 20,006 beds, and 6 additions, with 1,451 beds.

WHITE HOUSE — Underpinning and rebuilding of the interior is now under way to correct unsafe structural conditions. Estimated cost is $4,160,000, exclusive of engineering and construction fees.

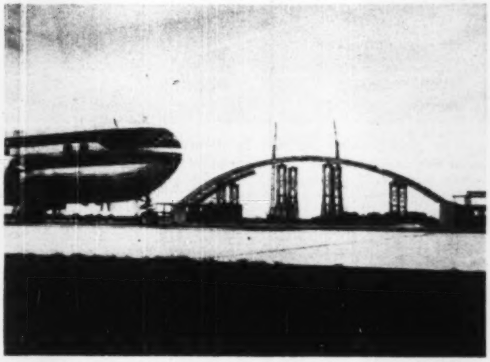
525 WILLIAM PENN PLACE BUILDING — The 39-story office building, scheduled for completion in May, 1951, may be the first completely air-conditioned office building in Pittsburgh, Pa. It will tower 515 ft 6 in. above street level, with foundations extending 80 ft below. Foundation excavation was started last August, and structural steel erection will start this month.

1407 BROADWAY—Steel for the 42-story, $20,000,000 air-conditioned office building in New York City was topped out in December. The owner plans to complete the lower section of 22 floors immediately and ask for a temporary certificate of occupancy, while the remainder is finished.

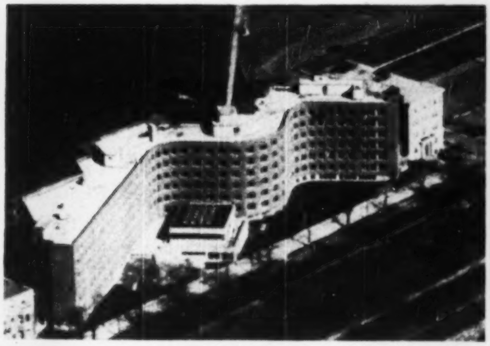
100 PARK AVE—A 36-story, $20,000,000 steel-frame, air-conditioned office building in New York City, contains 10,200,000 cu ft of space and about 800,000 sq ft of floor area.



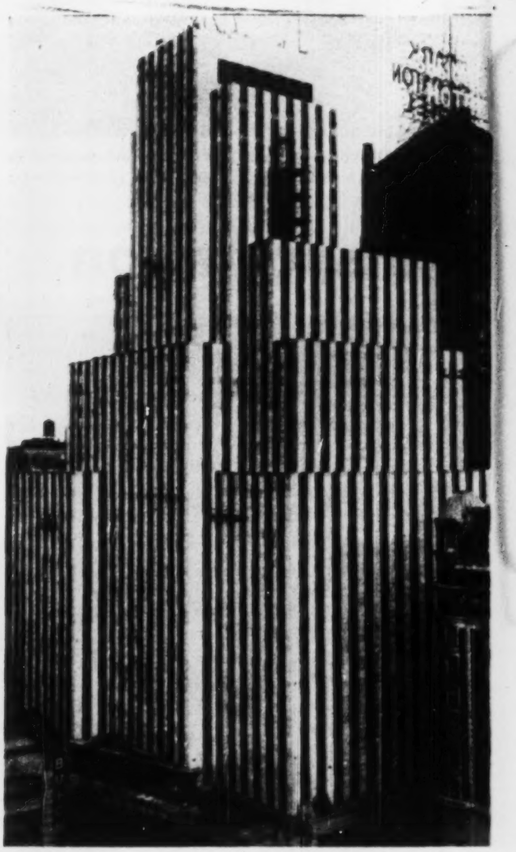
HANGAR at Limestone, Me., of thin-shell concrete, and the one at Rapid City, S. D., were finished in 1949. Spanning 340 ft with a 90-ft clearance, these are the longest-span concret hangars in the United States.



STEEL-ARCH HANGAR—Three like this one, each with a clear span of 300 ft, are being erected for the Port of New York Authority at New York International Airport in Queens, on the south shore of Long Island, at a cost of $9,200,000. They will be completed in May.



SERPENTNE DORMITORY and the Charles Hayden Memorial Library now under construction at the other end of the campus (not shown) are among the latest additions to the Massachusetts Institute of Technology on its campus at Cambridge, Mass.



AIR-CONDITIONED OFFICE BUILDING, 25 stories high will be completed this year in New York City in the growin office-building area just south of Central Park, for the Mutua Life Insurance Co. of New York, at a cost of about $11,500,000. It contains 575,000 sq ft of floor area. Frame is structural steel; exterior facing is limestone.

GULF FREEWAY in Houston now has 8¼ mi completed or under contract at a cost of $11,900,000. Four additional miles will be placed under contract by Texas State Highway Department this year, expected to cost about $4,000,000.

Transportation

THE nation's transportation facilities — highways, railways, airports and waterways—have not since the war exhibited the booming tendencies apparent in other fields of capital improvement. Highways, it can be stated with certainty, have not kept pace with requirements. Railways, beset with truck and pipeline competition which governmental regulations including high taxes makes it difficult to counter, have tackled only the most pressing new construction and improvements. Few airports can be made self-liquidating so that cities have been reluctant to match the federal-aid funds that are available. Waterway expansion, only in rare instances justified except as subsidized competition for the railroads, has had to take second place to river improvements for flood control and irrigation.

These were the conditions existent in 1949 in the field of transportation, and there is no present indication that they will change greatly in 1950. Only in bridge construction can the past and the future be said to be in balance with requirements.

Roadbuilding Lags

HIGHWAY CONSTRUCTION continued at a high level during 1949 although far below what the annual rate should be if an appreciable gain is to be made on the accumulated roadbuilding deficit. ENR contract award figures were down 8% from 1948 although federal estimates indicate that when all small jobs are taken into account a 7% gain resulted.

Regardless of statistics, encouragement can be found in the fact that most states improved their operations to the point where the full amount of federal aid for the current year should be covered by commitments before the year is out. Thus, the way will be cleared for the larger amounts of federal aid that will be asked by the states when their representatives appear before Congress in the near future. The current rate of federal aid is $450,000,000 per year. The American Association of State Highway Officials plans to ask Congress to step this up to $810,000,000 and to increase the federal share of the cost of work on the Interstate Highway System from 50 to 75%.

Prospects for so large an increase in federal aid are not bright, however. In his budget message to Congress the President recommended an increase of only $50,000,000 for the next two fiscal years.

Despite the President's failure to open the way for a more adequate road program, evidence of the growing need continues to accumulate. Most recent addition is an estimate compiled for other purposes by the Congressional Joint Committee on the Economic Report. That committee sets the nation's road needs at $41-billion. Even after allowance is made for exaggeration in some of the estimates included in the committee's tabulation of state requirements, that figure is staggering. It gives support to the conclusion of many students of highway finance that the deficit never will be made up without resort to bond financing in many states.

Such wider use of bond financing is contemplated in the federal-aid program that the AASHO expects to place before Congress. It will ask Congress to put in the next federal-aid act a provision permitting states to use federal-aid funds in future years to pay off the principal of general-obligation bonds issued now to finance any state's share of the cost of work on the Interstate System. Such a plan would permit any state to complete its portions of that basic 40,000-mile system much earlier than would be possible without a bond issue. Provision for such expansion through bond financing is important because several of the states do not now have sufficient highway income to match their apportionment of federal aid under the current program. They will need more under the expanded program proposed by the AASHO.

Highway Costs Decline

HIGHWAY CONSTRUCTION COSTS have shown a pronounced decline since the peak late in 1948. The composite-mile index of the Bureau of Public Roads has dropped 10%. Declines of as much as 25% in grading costs have been reported by some states.

Many factors appear to have contributed to this welcome development. Labor efficiency has increased, contractors are better equipped and now have more experienced crews, and bidding is keener. The expansion of road building that has occurred since the war has brought many new contractors into the field. Other firms expanded their capacity. The result now is apparent in the larger number of bids and the closer estimating of costs in preparing those bids.

Toll Road Planning

FAILURE to keep highway building up to needs is primarily responsible for the growth of activity in toll roads that was recorded during the past year. Outstanding was the decision to get construction started early this year on the 118-mile toll road running down through New Jersey from the New York metropolitan region to the new toll bridge over the Delaware River below Philadelphia. Pennsylvania is at work on both an eastern extension of its toll turnpike to the Philadelphia region and a westerly extension to the Ohio line. Ohio is actively studying a toll highway across that state. Oklahoma is reported to have succeeded in getting RFC aid for its toll road from Oklahoma City to Tulsa. And Colorado expects to start work in the spring on a toll highway from Denver to Boulder. New Hampshire's extension of the Maine Turnpike to the Massachusetts line will be open in the spring. Other toll road plans are less definite.

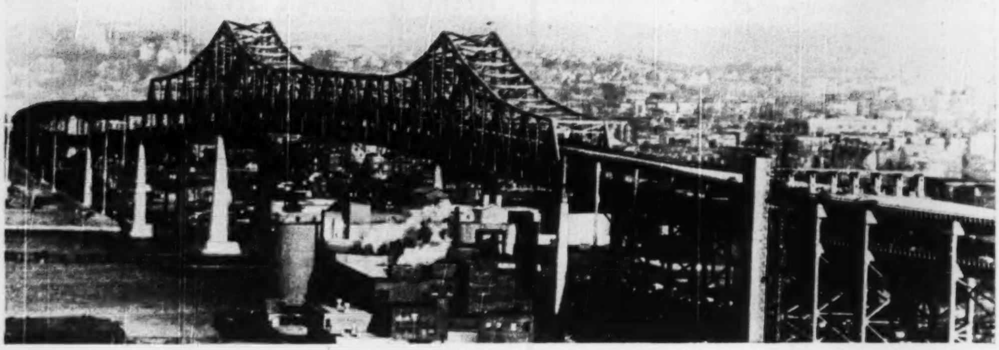
Highway Design Studies

SLOW BUT ENCOURAGING progress is being made toward solution of the many unsolved problems of highway design. Even on the controversial issue of how to design flexible pavements, the supporters of divers theories as to the correct way to determine the thickness of surfaces and bases appear to be much closer to agreement than they were a year or so ago. More light on this difficult problem should be provided by the studies of stress distribution in soils that have been started at the Waterways Experiment Station at Vicksburg.

Results of a 10-year study of continuously reinforced concrete pavement, as reported at the annual meeting of the Highway Research Board, can be expected to help clarify thinking on another subject over which there still is wide disagreement—the best methods for taking care of expansion in rigid pavements. These studies showed clearly that the theoretical amounts of longitudinal movement due to changes in temperature do not take place in long continuous sections of reinforced concrete.

Friction between the pavement and the base prevents movement except near the slab ends, the stress being absorbed by the steel and concrete. Railroad engineers made the same discovery when they began to weld long stretches of rails into one piece to get rid of the many problems caused by rail joints. In the long highway slabs many transverse cracks do develop soon after the concrete is laid, but the reinforcing steel

WILBUR CROSS PARKWAY was in full operation Nov. 1, when West Rock Tunnel (portals and approach shown) opened. Traffic now need cross no city streets between New York and Massachusetts lines.



MYSTIC RIVER BRIDGE connects Charlestown (foreground) and Chelsea, north of the center of Boston. Two three-lane roadways were double-decked to limit the width and the right-of-way costs of a six-lane, single-decked structure.

effectively keeps them from opening sufficiently to be harmful.

Noteworthy progress also has been made toward putting highway designing for traffic capacity on a rational basis. This has come about through careful analysis of records of vehicle performance under varying road conditions. Similarly, careful analysis of traffic accidents in relation to the physical conditions under which each accident occurred has focused attention on poor design practices and made it possible to correct some of them in designing new highways.

Progress also is being made in studies to determine how poor soils can be stabilized by admixtures of chemicals or organic compounds. A few experiments that have shown encouraging results in laboratory studies are now being taken into the field for full-scale tests. Unfortunately, some of the studies for which phenomenal results are claimed are shrouded in secrecy for what are said to be security reasons.

Bridge Building in Large Volume

MORE MONEY was spent on bridges in 1949 than in any year in history. Contracts at close to $360 million were up 20% over the previous year. The great bulk of this money went for small or medium-size structures, indicating that the state highway departments are concentrating on the removal of dangerous and inefficient bottlenecks in wholesale manner.

Such a trend should not suggest, however, that the need for large and monumental structures has been met, even temporarily. A number of such jobs are under design or in prospect. The most important, of course, is a new crossing of San Francisco Bay. The State of California, owner of the present bridge, favors a parallel facility, and has gone a considerable way in preliminary designs. The San Francisco city administration and certain business interests, however, want a low-level bridge and tunnel some blocks south of the present crossing. The resultant pulling and hauling delayed any action on the problem during 1949. In the meantime the state, through its toll bridge authority, built and put into service a new $1 million four-lane approach to new toll booths on the Oakland side of the Bay Bridge in an attempt to increase its traffic capacity.

Other large bridges in prospect are across Lower Tampa Bay at St. Petersburg, Fla., and—farther in the future—a second floating concrete bridge across Seattle's Lake Washington. There is little prospect that the long-talked-of suspension bridge at the Narrows of Lower New York Bay will be built for a number of years yet despite the fact that Corps of Engineers' permission to span the navigable waters was granted last year.

The most notable large bridge contracts of the past year related to three East Coast structures. The superstructure was let for the $40 million crossing of the Delaware at Wilmington involving a 2,150 ft suspension span: foundations are already under way (ENR Jan. 15, 1950, p36 and Jan. 26, 1950 p28). The substructure was let for a similar undertaking—in size, cost and type—across Chesapeake Bay below Baltimore involving a suspension span of 1,600 ft. And contracts were awarded for both foundations and superstructure for a unique, tandem, swing span structure over the York River at Yorktown, Va. This latter job, with caissons going down 150 ft, is apt to be the outstanding bridge pier operation of 1950.

The Delaware and Chesapeake bridges take on special significance along with the rebuilt Tacoma Narrows bridge in Washington, now in the cable spinning stage, as the first suspension structures to emerge from the pall cast over this type by the failure of the first Tacoma Narrows bridge a decade ago. In the meantime searching investigations have focused on the problem of aerodynamic stability in suspension bridges. The first of three reports from the investigation, carried out at the University of Washington, was published last year. The second will be available soon.

The only serious bridge accident of the year occurred during the erection of a cantilever span over the Bluestone River in West Virginia. The profession still awaits an explanation of the cause of this disquieting collapse, which occurred when 231 ft of the 278 span had been cantilevered under the relatively light load (7 tons) of a guy derrick.

Bridge Design Trends

IN BRIDGE DESIGN GENERALLY, several significant trends may be noted. Designers of city viaducts and multi-lane bridges are giving particular attention to providing more efficient approaches and access ramps. More and more, these important structures are being integrated with an overall city traffic plan. Each of these developments puts a premium on designer ingenuity and foresight.

A fact more than a trend relates to the important role that consulting engineering firms played on both city and state bridges in 1949. They were active in preliminary project studies, in actual structure designing and on inspection during construction. Whether this situation continues depends largely on the attitude of city- and state-employed engineers, some at least of whom look upon the use of consulting engineers as an emergency expedient only.

The attempts to develop a more or less standard low cost bridge for secondary roads continue in many places Most of the work has been with conventional materials and methods, but a few studies are beginning to concentrate on new designs and different construction methods. Both in Pennsylvania and Washington, some success has been attained with short precast concrete spans.

Bridge strengthening by welding is on the increase, and newly-developed structural plate for redecking old bridges has been used advantageously from standpoints of both speed and low cost. Bridges designers are paying more attention to developing handrailing of more pleasing appearance, without sacrificing strength. Also more safety is being incorporated into small bridges by adopting roadway widths equal to widths of approach embankments rather than the widths of the approach pavement only. An all-aluminum bridge, the third ever to be built, was brought near to completion at Arvida, Quebec. It is a 290-ft arch with short span girder approaches. The previous aluminum bridges were a 100-ft plate girder and a 121-ft double-leaf bascule.

A Prodigal Returns

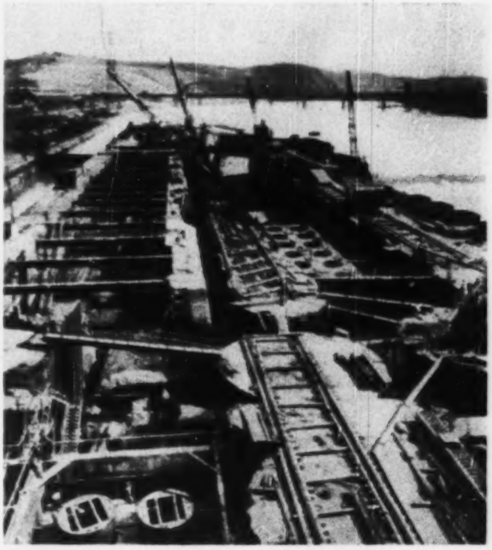
PROBABLY the outstanding development in bridge construction in 1949 was the starting of the first prestressed-concrete bridge in the United States. The structure, known as the Walnut Lane Bridge, is being built for the city of Philadelphia, Pa.

Prestressed concrete dates back at least to 1886, when a patent specification was issued to P. H. Jackson of San Francisco. In 1928, R. E. Dill of Alexandria, Neb., obtained a patent for the construction of prestressed concrete units with unbonded steel. But little use was made of this new technique in the U. S. The early pioneers employed low steel stresses, as for ordinary reinforced concrete, and a good deal of the prestress was lost due to shrinkage and plastic flow of the concrete, making the method uneconomical.

In 1928, Eugene Freyssinet filed his fundamental patent in France; he demonstrated that high-strength steel is essential to the success of prestressing. Subsequently, many prestressed structures were erected throughout Europe; but despite the success of prestressing abroad, it made little headway in the U. S. Last year, prestressing re-crossed the Atlantic.

For those not familiar with the technique, it may be explained that the method involves application of forces to concrete to overcome the tensile stresses caused by loads, volume changes and impact. In one manner or other, steel rods or wires are stretched and then released to induce compression in the concrete, either through bond or anchorages. This creates a concrete capable of taking tension without cracking; the entire section resists bending moment. Consequently, a prestressed beam can carry much heavier loads without cracking than a reinforced concrete beam of the same section. Or it can span much greater distances than so far has been possible with conventionally designed beams.

Prof. Gustave Magnel of Belgium developed the method being used for the Walnut Lane Bridge. He precasts the concrete with the wires in ducts to prevent bond, tensions the wires two at a time with a jack acting against the hardened concrete, and anchors them with wedges to steel plates at the ends of the



WIDER, LONGER LOCKS for the Monongahela River shipping at Braddock, Pa. Outside wall being built in 1,190-ft-long cellular cofferdam, while one of old locks remains in service. (Dravo Corp. photo) girders. Then, he grouts the wires in place, to protect them against corrosion and to supplement anchorage.

The Walnut Lane Bridge will have a 160-ft main span, consisting of 13 prestressed girders 6 ft 7 in. deep. set side by side. Two 74-ft side spans will each have 7 prestressed girders. Last November, a full-size replica of one of the main-span girders was publicly tested to destruction. The design was shown to be overly conservative.

Railroads and Waterways

RAILROAD EXPENDITURES for new work in 1949 fell considerably below the record high set in 1948. Figures compiled by RAILWAY AGE set the total for new line construction, yards, locomotive service facilities, buildings and bridges at $343 million. New tracks built for line or grade revision or for relocations made necessary by reservoir construction total 88 miles, a slight increase over 1948. Most of the new capital investments were made to increase operating efficiency.

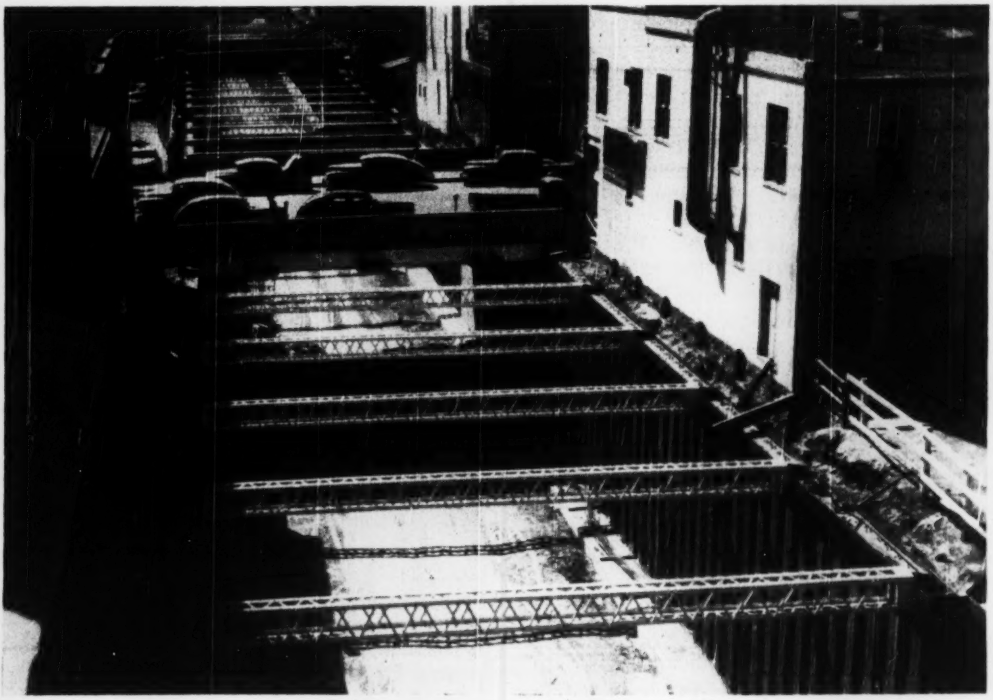
In West Virginia the Norfolk & Western Ry. holed through a new double-track Elkhorn Tunnel last year. And the Union Pacific R. R. opened its second tunnel at Aspen, Wyo., to complete a double tracking project. A major rail terminal development was undertaken in Houston, Tex., where local business interests organized to replace existing freight and passenger facilities with a modern warehouse and office building. And in the state of Washington, the Great Northern Railway set about continuous-welding all rails in its 7.79-mile Cascade Tunnel for less corrosive damage and lower maintenance costs.

No major waterway developments occurred during the past year. However, studies are under way for deepening the navigable channel in the Ohio River from 9 to 12 ft. If that plan goes through a large amount of construction will be involved ultimately, and similar work doubtless would follow on the lower Mississippi River. In fact, channels for the big harbor project at Memphis are being built to the 12-ft depth.

At the upper end of the present canalization of the Mississippi two locks are being built at Minneapolis which will permit extending that waterway for better service to the Twin City region. Work has been started on the first of 12 locks and dams required for a 9-ft channel in the Cumberland River.

More Airport Building

AIRPORT CONSTRUCTION made encouraging gains in 1949, the total of around $100-million being more than twice what was done in 1948. This total still is far below what was foreseen when Congress set up the current program in 1946. That program called



GRADE CROSSING ELIMINATION—In El Paso, Texas, the state highway department is depressing tracks used by four major railroads, to eliminate eight main-street grade crossings. Included in the job: a storm sewer and three pumping stations.

for a total expenditure of one billion dollars by 1953, of which $520-million was to be federal aid. Last year the Civil Aeronautics Administration paid out $46.3-million, which was matched by local sponsors. By the end of the current fiscal year the CAA will have advanced a total of $85-million for aid to local airports.

For the following fiscal year the President has recommended that Congress appropriate $51.3-million additional federal aid and approve an additional $36.7-million in contract authorization. Most of the latter would be for expenditure on 86 large airports where traffic is heavy enough to justify control towers.

At the end of the year the CAA had 311 projects under construction involving $39.5 million in federal aid.

Late in 1949 the CAA issued a ruling that it would no longer approve the constructoin of more than one runway for any airport unless there was a clear showing of the adequacy of such a layout. This was not based on any expectancy that caster landing gear will be used on the heavier planes but on evidence that the larger commercial aircraft are able to land on a single, properly oriented strip at nearly all times anywhere in this country.

Some Major Transportation Projects

NEW HAMPSHIRE TURNPIKE—Built to connect with Maine's Portland-Kittery turnpike, this four-lane 15-mi coastwise border-to-border toll road was 85% complete Jan. 1, and will be opened in June when Massachusetts completes a one-mile tie-in to U.S. 1. Cost: $7,500,000.

NORTHERN CIRCUMFERENTIAL HIGHWAY—By-passing Boston on the north and west, this new limited-access public road, to cost $20,000,000, approached the fully-contracted stage Jan. 1. Total length, between Lynnfield and Wellesley, is 22.5 mi.

BOSTON VEHICULAR PROJECTS—Three projects under construction Jan. 1 will improve Boston's traffic situation. Located fanwise from the city's center, they are the **East Boston Expressway** (NE), the **Mystic River Bridge** (N), and the **Sullivan Square** project (NW). The $10,000,000 2-mi expressway was 85% complete Jan. 1. Partly elevated, it will conduct traffic from the Sumner Tunnel northward to suburban highways and eastward to Logan Airport. The $27,000,000 Mystic River bridge was 90% complete, for March opening. Its 2-mi length crosses most of Charlestown, the Mystic and several blocks in Chelsea. Sullivan Square is an old Charlestown bottleneck that is being revised to handle 50,000 vehicles a day. Structures placed under contract in December 1949 include an underpass and two overpasses, a traffic rotary and a pedestrian overpass. Present work amounts to $4,200,000. A later contract will include two bridges over railroads. Completion date is mid-1952.

WEST ROCK TUNNEL—The last gap in Connecticut's pioneer parkway route (Merritt-Wilbur Cross) was opened Nov. 1, 1949. The twin-bore tunnel and approaches cost $3,000,000. They make it unnecessary for through traffic to wind through New Haven.

NEW YORK AREA VEHICULAR PROJECTS—**New York City expressways:** twelve contracts totaling $18,700,000 were awarded during 1949 for work on expressways, as follows: five contracts on the **Cross-Bronx Expressway** totaling $10,500,000 for construction of 1.87 mi. including 0.84 mi. of paving, and 1.03 mi of grading and structures; three contracts on the **Major Deegan Expressway** amounting to $5,500,000 for work on 1.19 mi, including 0.30 mi of paving, 0.72 mi of grading and structures, and 0.17 mi of miscellaneous work; three contracts for 0.70 mi of miscellaneous work on the **Brooklyn-Queens Expressway** at a cost of $800,000, and one contract on the **Van Wyck Expressway** for 0.89 mi of grading and structures at a cost of $1,800,000. This contract and others in force Jan. 1 provide all required work on the Van Wyck Expressway, except paving, from Queens Boulevard to the International Airport at Idlewild.

New York City Parkways: Three contracts on the **Bronx River Parkway**, Southern Extension, for 1.08 mi of grading and structures at a cost of $5,600,000.

Long Island: Two contracts for extension of **Southern State Parkway** in Suffolk County, totaling 3.47 mi at a cost of $1,000,000 and including 3 mi of paving and 0.47 mi of miscellaneous work. One contract for extension of **Northern State Parkway** in Suffolk County totaling 5.61 mi at a cost of $1,000,000 and including 4.90 mi of paving and 0.71 mi of grading.

Final contract for completion of the 2,144-ft **Roslyn viaduct** on the North Hempstead Turnpike awarded.

Westchester County: An additional 4.11 mi of the **Sawmill River Parkway** between Chappaqua and Mt. Kisco was opened to traffic with completion of a $1,500,000 contract.

TRIBOROUGH PROJECTS (N. Y.)—The foregoing projects are handled by the New York State Department of Public Works. The Triborough Bridge and Tunnel Authority expects to open its $80,000,000 **Brooklyn-Battery Tunnel** in mid-1950. Extending 9,117 ft, in twin two-lane tubes, the tunnel will connect Manhattan's circumferential routes with a Brooklyn belt route. The job was 95% complete Jan. 1, $11,700,000 worth of work having been done in 1949. The Authority now has another project under construction — **Ward's Island pedestrian bridge.** To cross the Harlem River at a cost of $2,100,000, the job was 8% along Jan. 1, with completion scheduled near the end of 1950. Principal feature is a plate-girder lift span 330 ft long.

PORT OF NEW YORK AUTHORITY PROJECTS—Two other vehicular projects are the responsibility of PNYA: **179th St. Tunnel**, an improvement of the New York approach to George Washington Bridge, costing $7,400,000, was begun in March 1949, will be completed by the end of 1950; **Holland Tunnel Exit Viaduct**, Jersey City, a $3,100,000 job, was begun in October, 1948, will be completed this year.

NEW YORK STATE THRUWAYS—Contracts amounting to $14,068,000 had been let for work on four sections of the New York State thruway system at the end of 1949. These are located east of Buffalo, north of Syracuse, south of Rochester, and parallel to Route 9W between Catskill and

COMPLETED in 1949, this section of California's Bayshore Freeway bypasses an industrial suburb just south of San Francisco.

Saugerties below Albany. They total to 37.4 mi. Of this distance, 12.7 mi. had been paved at the end of the year and 4 mi had been opened to traffic. Ultimately, this system is to be made up of a four-lane divided highway, limited as to access, extending from the New York metropolitan region up the Hudson River to near Albany and then west to the Pennsylvania line, a total distance of 486 mi.

NEW JERSEY PARKWAYS—Grading and paving is nearing completion on the first 10 mi. of the **Route 4 Parkway** in New Jersey, a divided four-lane highway that ultimately will extend through the length of the state. This section, from the Raritan River to Cranford, will be opened next summer. Contracts for other sections have been let, the total to date being $20,585,000. Grading has been completed on 2 mi of the **Palisades Interstate Parkway** at Englewood Cliffs and Tenafly and a contract for paving 1.2 mi has been let. The alignment of this 12-mi parkway to the New York state line has been determined. Ultimately it will be linked with the Route 4 Parkway. Commitments to date total $1,353,000.

NEW JERSEY TURNPIKE—In anticipation of early completion of negotiations for the sale of about $230,000,000 in bonds to finance New Jersey's 118-mi toll turnpike, bids have been called for grading 20 miles at the southern end of the turnpike, on piers for the Raritan, Passaic and Hackensack River bridges, for embankment construction and subsoil stabilization between the latter two bridges and through the Standard Oil Co. plant at Bayway. Current plans call for completion of the whole project by the end of 1951.

PENROSE AVENUE BRIDGE — Piers for this $12,000,000 structure in Philadelphia were complete at the year-end and steel erection is underway. Containing a cantilever main span across the Schuylkill River, the bridge will speed industrial traffic along the Delaware below Philadelphia and provide quicker access by motor transportation to the city's Southwest Airport.

PENNSYLVANIA TURNPIKE — By Jan. 1, 1952, Pennsylvania will have a toll road from the vicinity of Philadelphia to the Ohio line northwest of Pittsburgh. A 100-mi **eastward extension** of the original 160-mi road was 44% complete Jan. 1, with opening scheduled Jan. 1, 1951; a 67-mile **westward extension** was barely under construction Jan. 1. Costs are $87,000,000 on the eastward extension and $78,300,000 on the westward. A final $2,400,000 worth of work on the eastward extension will be placed under contract in 1950.

PENN-LINCOLN PARKWAY — Pittsburgh's 6.2-mile limited-access artery from the eastern suburbs to the city's heart was under contract or completed to the extent of $27,600,000 at the end of 1949. Completion is expected in October, 1951. About $6,000,000 remains to be contracted; this amount includes work for completion of 4,000-ft Squirrel Hill Tunnel, for which excavation was completed in 1949.

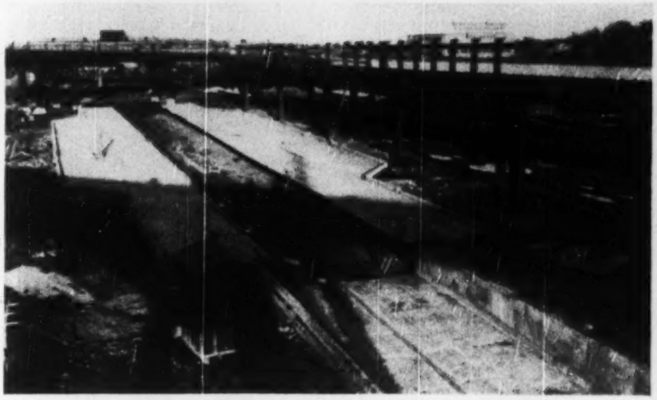
DELAWARE MEMORIAL BRIDGE—Vital to the New Jersey Turnpike's success is this $40,000,000 four-lane structure crossing the Delaware below Wilmington, at the Turnpike's lower end. Overall project length of 3½ mi includes the world's sixth longest suspension span, 2,150 ft. Work was 32% along Jan. 1, with completion scheduled in mid-1951. Superstructure work began in February.

CHESAPEAKE BAY BRIDGE—To cross more than 4 mi of open water, this $44,100,000 two-lane bridge project near Annapolis, Md. got under way in 1949 with $37,500,000 of contract awards (4% progress Dec. 31); it will be completed in mid-1952. The job includes 123 spans ranging from 50 ft to 1,600 ft, the latter being a suspension span affording 186-ft channel clearance 1,500 ft wide. Project length is 7.7 mi. including the approaches.

ANNAPOLIS-WASHINGTON EXPRESSWAY—This 25.7-mi double-barreled route eventually will carry Chesapeake Bay bridge traffic from Revell, Md. to the District of Columbia line. Work also includes a 2-mile spur to Annapolis. Of $27,200,000 overall cost, $10,600,000 was authorized in 1949, for 9.8 miles at the eastern end. This work was 10% complete Jan. 1. The remaining period of the work has not yet been scheduled definitely.

BALTIMORE-WASHINGTON EXPRESSWAY—A modern substitute for U. S. 1, this limited-access route is a project of the State of Maryland and the federal government. Maryland's 10-mi share, plus connections, is to cost $15,400,000; $8,200,000 of which was under contract by Jan. 1. The remainder will be contracted in 1950. Jan. 1 overall progress was 35% toward late 1951 completion. The government's share, 18.5 mi, has been graded and drained for 6.5 mi, at $2,000,000. The remainder of work, including surfacing, will cost $9,500,000.

DISTRICT OF COLUMBIA PROJECTS—Three of Washington's four major bottleneck-elemination projects were in complete or partial use shortly after the first of January. **Whitehurst Freeway,** the $3,400,000 K St. elevated approach to Key Bridge, was opened in October. **South Capitol St. Bridge,** including the world's longest plate-girder swing span, across the Anacostia River, was opened Jan. 14; cost, $5,400,000. DuPont Circle Underpass ($3,800,000) was 90% complete Jan. 1, with two streetcar tunnels already in use; vehicular tunnel should be open in April. The $5,900,-



TRANSPORTATION FACILITIES at Boston's Logan Airport include: East Boston line of the city's subway (ramp and station platforms, foreground); the East Boston Expressway spur to the terminal (steelwork for elevated section, background).

000 East Bridge across the Potomac at 14th St. also is expected to be ready in April; progress was 95% Jan. 1; final completion delayed by settlement of D. C. abutment, which subsequently has been underpinned.

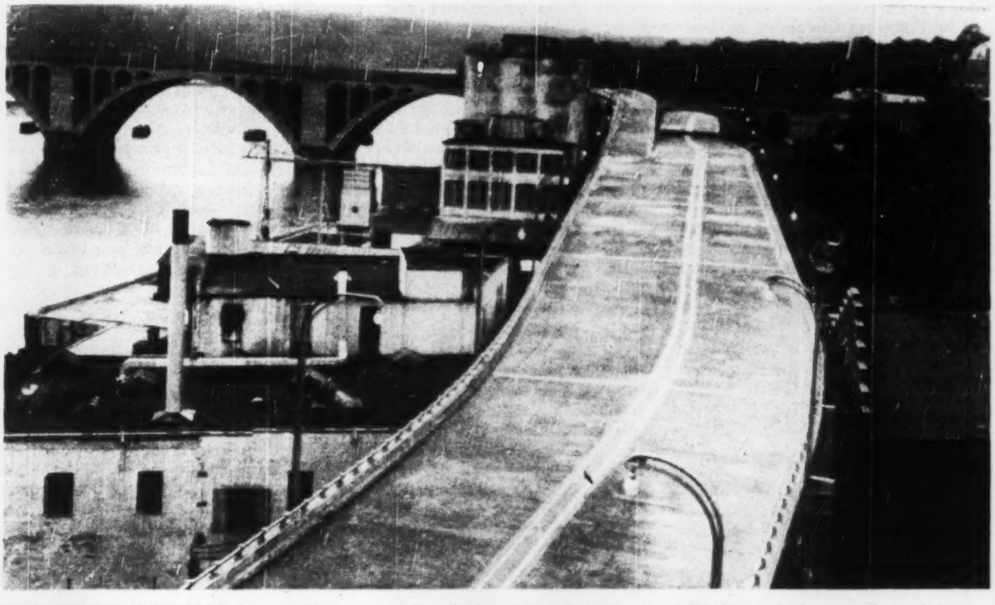
SHIRLEY MEMORIAL HIGHWAY—Another U. S. 1 by-pass road runs in Virginia, from the Pentagon, Arlington, 17.3 mi southward to a point on U. S. 1. It was opened Sept. 1, 1949, 80% complete; for 5 mi at the lower end, vehicles travel on one of two two-lane roadways, the other roadway being under construction. $5,500,000 has been spent so far.

BLUE RIDGE PARKWAY—1949 construction on this 477-mile national road in Virginia and North Carolina cost $2,500,000. Work included grading, structures and 9 mi of paving. The latter brought total travelable mileage to 254.

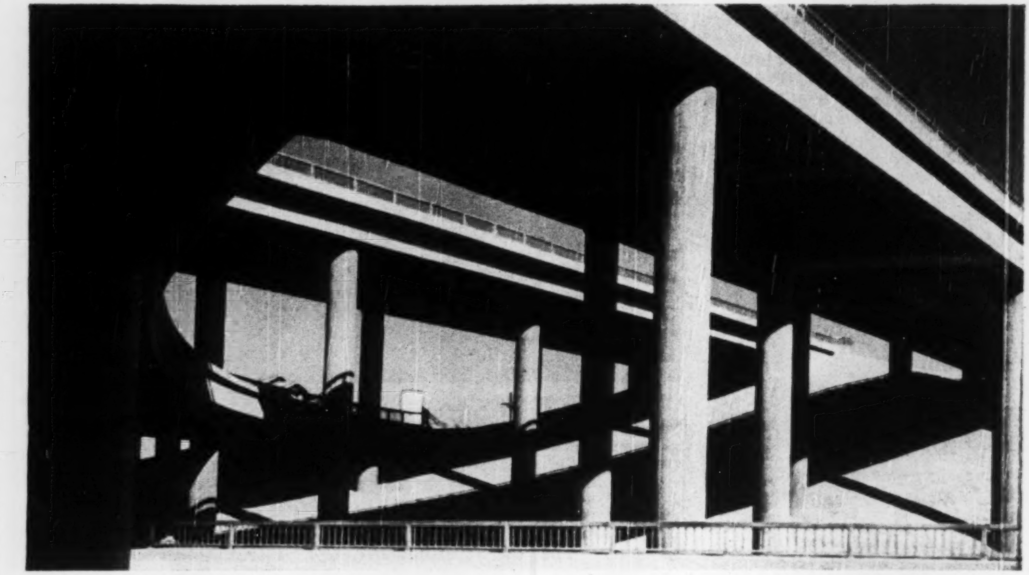
YORK RIVER BRIDGE—The first of four huge caissons for the river piers of this $9,000,000 highway toll structure at Yorktown, Va., is scheduled to be towed to the site about April 1. It will be 52x66 ft in plan and 110 ft high. Approach work is already under way, and the superstructure contract has been let. The latter encompasses two 500-ft equal-arm swing spans to be set tandem. When both are open the resulting shipping clearance will be sufficient to pass naval vessels of the largest size. Both the foundations and the superstructure make this one of the outstanding bridge jobs under construction during 1950.

BRUNSWICK, GA. BRIDGE—Substructures for the 4,470-ft bridge across Turtle River were 67% complete Jan. 1. Piers will cost $3,000,000 and they will be finished June 30. The Georgia legislature has not appropriated $3,000,000 for the superstructure, which will include a 264-ft lift span. Together with a new connecting highway, the bridge will eliminate a long backward loop for coastal traffic through Brunswick.

ST. SIMONS CAUSEWAY — Another project at Brunswick is this $2,500,000 replacement of an existing toll causeway, whose timber structures have become dangerous and expensive to maintain. Consisting of 3.3 miles of fill over marsh, the new project also includes five bridges, with 1-mi aggre-



WHITEHURST FREEWAY takes up-Potomac and Key Bridge traffic off the streets of Washington's Georgetown section.



FOUR LEVELS of traffic will glide through this interchange at Hollywood and Harbor parkways in Los Angeles. Costing $1,300,000, interchange was the biggest California bridge job of 1949.

gate length. Two bridges contain lift spans to provide 100-ft channel height-clearance. Begun in April, 1949, the job will be complete in May, 1950.

CLEVELAND (OHIO) BRIDGES—Contracts have been awarded for the first of 7 railroad bridges to be built over the Cuyahoga River in a six-year, $22,000,000 bridge-replacement program by the railroads and the Corps of Engineers. All but one are vertical-lift through trusses. Under contract is a single-track, 234-ft span for the Nickel Plate, costing $2,500,000. Four bridges for the New York Central include: a 260-ft, single-track, $2,000,000 bridge expected to be started this year; twin 228-ft span, single-track bridges, for $5,000,000 total, expected to start next year; and a double-track 265-ft span for both the NYC and the Pennsylvania R.R., costing $5,100,000. The other two bridges are a double-track 267-ft span for the Nickel Plate, costing $4,200,000; and a 255-ft double-track bascule for the B & O R.R. costing $2,900,000.

DETROIT EXPRESSWAYS—By the end of last year, $31,500,000 had been spent on the north-south **John C. Lodge** and the east-west **Edsel Ford** expressways, including work completed, contracts awarded and right-of-way. The first paving contracts have been awarded on both expressways. Last year on the Edsel Ford expressway $2,467,000 worth of work was placed under contract; $2,073,000 of construction was completed; and $4,872,000 was spent for right-of-way. This year the Michigan State Highway Department will award $4,349,000 worth of construction and purchase $4,200,000 of right-of-way for this 5.5-mile project. The Wayne County Board of Commissioners awarded $2,700,000 worth of contracts on the John C. Lodge expressway last year and completed $2,000,000 of construction. They expect to let $3,700,000 worth of construction contracts this year. All but $200,000 worth of right-of-way has been bought for this 3.6-mi project.

CHICAGO BRIDGES—Work will start this year on the twin double-leaf, $3,500,000 **Congress Street bridge**; also two other bascule bridges, six viaducts, and major reconstruction repairs to five other bridges. The war-delayed, three-truss double-leaf trunnion bascule **Bataan-Corregidor Memorial Bridge** carrying North State St. over the Chicago River was completed last year at a total cost of $3,000,000. Span length between piers is 210 ft. Top width is 108 ft carrying two 36-ft roadways and 11-ft sidewalks.

MINNESOTA BRIDGES—Structural steel erection has just been started on the 1,829-ft state highway bridge over the Mississippi River at **Hastings, Minn.** Substructures are finished, and the entire project will be completed by December. The bridge is made up of a 514-ft continuous tied steel arch with 225-ft side spans, five continuous concrete deck girder spans and 5 simple deck plate steel girder spans. It will carry a 32-ft roadway and one 4½-ft sidewalk. Substructure construction for the $4,000,000 Minnesota-Wisconsin interstate bridge over the St. Croix River at **Hudson, Wis.**, is 33% complete. A recently awarded superstructure contract will be completed this September. The 2,311-ft bridge contains a three-span, 968-ft cantilever, four 250-ft through-truss and three 110-ft deck plate girder spans. A railroad underpass bridge and a highway grade interchange, part of the project, have been completed.

EAST ST. LOUIS BRIDGE—Completion of the $6,880,000, four-lane highway bridge over the Mississippi River at East St. Louis, Ill. is scheduled for next October. It was 73% completed on last Jan. 1. Steel structures include a 1,903-ft cantilever span, two 213-ft and one 249-ft truss spans, two 120-ft deck plate girder spans and 2,432 lin ft of steel trestle spans. Designed for an H-20 live load, the entire bridge will be 1.5 mi long from its eastern terminus in East St. Louis to its western terminus in St. Louis, Mo. The 964-ft central span of the cantilever, over the navigable channel, is the longest such span on the Mississippi.

MISSOURI EXPRESSWAYS—Construction of the first stage of the **Southwest Trafficway** in Kansas City, Mo.—a 2,960-ft six-lane divided viaduct—will be completed this year. A $647,000 contract for the reinforced concrete substructure was completed last October, and the $1,708,000 steel superstructure will be finished this May. Contracts have been awarded for the reinforced concrete deck on the viaduct and ramp interchanges. Right-of-way costs on the project to date total $705,000. Plans are being prepared on the **Sixth Street Trafficway** in Kansas City; estimated to cost $3,000,000 for right-of-way and $3,000,000 for construction. Right-of-way totaling $775,000 has been purchased for a proposed urban expressway project in **St. Louis.**

TEXAS EXPRESSWAYS — The Texas State Highway Department will let contracts this year for the construction of 18.9 mi of expressways in its five major cities at a total cost of $17,000,000. This new construction includes 3.5 mi of expressway in **San Antonio;** 4.0 mi each for **Dallas** and **Houston;** 5.4 mi in **Fort Worth** and 2.0 mi in **Austin.** The Austin project is just now getting underway. Last year the department awarded $6,300,000 worth of expressway contracts in the four other cities. A great deal of the Fort Worth expressway was completed in 1947-1948. Expressway construction completed last year in San Antonio, Dallas and Houston totaled 6.6 mi at a cost of $11,000,000. By the end of 1951 Texas will have underway or completed a total of 42.2 mi of expressways in its five major cities at a total cost of $43,900,000, exclusive of right-of-way, which is furnished by the cities. A breakdown of this total program shows: San Antonio, 7.4 mi of expressway at $9,725,000; Dallas, 9.1 mi at $9,233,000; Houston, 12.3 mi at $15,922,000; Fort Worth, 11.4 mi at $7,388,000 and Austin, 2.0 mi at $1,650,000. None of these expressways will be considered completed by the end of 1951, their ultimate lengths depending on future financing, future needs and their acceptance by the public.

DENVER VALLEY HIGHWAY—Contracts awarded by the Colorado State Highway Department to date on the 10.2-mi Valley Highway in Denver total $3,500,000, covering 2-mi of expressway and two large interchanges. Contracts for an additional $1,600,000 worth of construction will be let this year. Total cost of the project, estimated to take from 6 to 8 years for completion, is $14,000,000 for construction plus $6,000,000 for right-of-way. Plans have been completed for 4.7 mi of the project and the remainder are being prepared. Right-of-way purchased to date total 2.0 mi.

CALIFORNIA FREEWAYS — Freeway construction in California continues as swiftly as available funds permit with 8.8 mi open to traffic on four major freeways in 1949, at a cost of $12,700,000 (exclusive of right-of-way). Contracts in effect but not complete as of Jan. 1, 1950 follow (figures in parentheses are additional construction money available up to June 30, 1951): Hollywood Parkway $7,500,000 ($9,100,000); Santa Ana Parkway $2,200,000 ($4,600,000); Eastshore Freeway $4,400,000 ($4,600,000); Bayshore Freeway $3,400,000 ($2,200,000); Ramona Parkway $1,500,000 ($1,900,000); and Harbor Parkway $500,000 ($900,000). These figures are for major freeways with six or eight traffic lanes located in metropolitan areas. Not included above are many minor freeways that bypass or provide better access to smaller cities and towns all over the state.

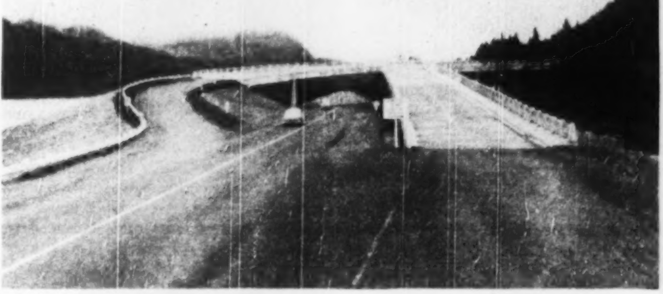
Routes of the major freeways are: **Hollywood** and **Santa Ana Parkways** extend from North Hollywood through the heart of downtown Los Angeles to Santa Ana; **Harbor Parkway** extends from downtown Los Angeles to the San Pedro harbor area; **Ramona Parkway** extends east from Los Angeles to Pomona; the **Eastshore Freeway** extends from the Carquinez Bridge along the east side of San Francisco Bay south to San Jose (passing the east end of the San Francisco-Oakland Bay Bridge); and the **Bayshore Freeway** extends from the west end of the Bay Bridge along the west side of the Bay south to San Jose.

CALIFORNIA BRIDGES — Bridge construction on California highways continued at $17,000,000 a year clip. Most spectacular structure completed in 1949 was a $1,300,000 four-level grade separation at the intersection of two major freeways in Los Angeles. More than 60 percent of the bridge construction funds were spent on freeway separation structures and interchanges. Other major structures completed in 1949 bridged the Sacramento River at Butte City ($688,000), the San Joaquin River at Herndon ($652,000), and the Santa Ynez River near Buellton ($526,000).

SAN FRANCISCO CROSSINGS—Construction of a $155-million bridge paralleling the existing Bay Bridge is stymied by lack of a Congressional permit to cross Federally-owned Yerba Buena Island. The permit is blocked by proponents of a southern crossing. Meanwhile, construction of a $50-million system of approach modifications proposed by the California Toll Bridge Authority to afford temporary traffic relief is awaiting agreement by cities involved as to what structures should be included. Construction of these approach works will probably get underway in 1950.

TACOMA NARROWS BRIDGE—In spite of unavoidable delays due to earthquake and fire, towers for the second Tacoma Narrows Bridge were completed in mid-1949. Spinning the suspension cables is now nearly complete. Final work on the suspended structure of the $14,000,000 bridge is scheduled to be finished late this summer.

HARBOR DRIVE EXPRESSWAY—The last contract involved in this 3.36-mi, six-lane arterial in Portland, Ore.,



COLUMBIA RIVER HIGHWAY now follows a water-level route through the Columbia River Gorge east of Portland, Ore. Bridal Veil traffic interchange (above) connects express route with old highway.

will be let in March, 1950. This contract includes construction of an articulated traffic interchange at the east approach to Steel Bridge over the Willamette River and will cost $700,000. Contracts completed or under way total $4,960,000. The right-of-way costs for this project have amounted to $2,125,000.

SULLIVAN GULCH EXPRESSWAY—This contemplated four-lane arterial is to extend from the heart of Portland, Ore., east on U. S. Highway 30 to Troutdale, a distance of 14 mi. Construction cost is estimated at $9,000,000 and right-of-way cost at $4,800,000. Purchase of right-of-way is in progress with $1,000,000 expended during 1949.

COLUMBIA RIVER HIGHWAY—Final contracts for grade separations and pavement were let in 1949 for the 19.2-mi water-level route through the Columbia River Gorge east of Portland, Ore. Construction will be completed early in 1950. Total construction cost of the project will be $6,600,000. A 5.22-mi extension (Dodson to Bonneville), estimated to cost an additional $1,500,000 was contracted late in 1949 with completion scheduled for Nov. 1, 1950.

ALASKAN WAY VIADUCT—Construction of a double-deck elevated expressway bypassing the heart of Seattle, Wash., got underway with the award late in 1949 of a $1,200,000 contract for 2,252 ft of 6-lane structure. An additional 4,095 ft of double deck structure is expected to be up for bids in March and the final 1,401 ft will be advertised before the end of the year.

HONOLULU, T. H.—Contracts involving $1,300,000 are completed or underway on the 4-mi, six and eight lane asphaltic concrete arterial highway being built along Honolulu's waterfront. The rest of the $5,300,000 job should be under contract in 1950. Contracts for $900,000 in approach roads have already been let and another $900,000 approach road contract should be let this year, in preparation for a $5,600,000 tunnel and highway project to improve the road from Honolulu to its windward Oahu suburbs across the famous Nuuanu Pali.

HILO, T. H.—Eleven miles of a 24-ft wide, 40-mi Hamakua coast highway project are complete. Route travels over rugged terrain with 40 major and several minor bridges required, and rainfall totals up to 270 in. a year. Contracts for 15 more mi are to be let this year. Total cost by completion in 1952 is estimated at $12,000,000.

MOUNT SAN JACINTO AERIAL TRAMWAY—This $9,000,000 project near Palm Springs, Calif., to lift tourists and skiers more than a mile in a 13,151-ft travel may get underway this year. A traffic survey is underway and revenue bonds are slated to be sold after that is completed.

RAILROAD CONSTRUCTION — During 1949 the **Illinois Central R.R.** stabilized 5,430 lin ft of roadbed south of Memphis, Tenn., by pressure grouting with cement grout; also 17,030 ft of roadbed in Illinois. About 22,000 ft of railroad roadbed will be pressure grouted this year. The **Union Pacific R.R.** double-tracked 4.9 miles of line near Los Angeles last year and 1.8 miles at the new Altmont tunnel in Wyoming. No double tracking is planned for 1950.

NORFOLK AND WESTERN LINE CHANGE—Construction of a 5.2-mi change in line and grade on the double-track main line of the Norfolk and Western Ry. through the rugged country between Cooper and Lick Branch, W. Va., was 75% complete at the end of 1949. Included is a double-track tunnel 7,050 ft. long to replace a single-track tunnel on the old line. Total cost $11,500,000. One track will be in service by mid-year and the second track about the end of the year.

BOSTON SUBWAYS—Extension of rapid transit 2.1 mi from present underground station in East Boston had progressed 60% Jan. 1, with completion expected in mid-1951. The two-track line continues 2,000 ft underground, then emerges to grade, the first above-ground station being at Logan airport, near the East Boston expressway airport connection. The Metropolitan Transit Authority assumed responsibility for subways during the year.

NEW YORK SUBWAY—The Hillside Ave. IND division extension, adding a half mile of 4- and 8-track subway in the city's fastest-growing borough, will be complete this spring; total cost $7,600,000. In 1950 several subway-system improvements will be started, the most important being an $8,000,000 underground connection between the IND and BMT divisions at Queens Plaza, to allow IND trains to operate through BMT's uptown East River tunnel. Another service to Queens residents will be a $5,900,000 project to lengthen stations on the IRT division line going to Flushing.

TORONTO SUBWAY — Canada's first subway took definite form in 1949 as work got underway on the first $10,000,000 increment of a 4½-mile $40,000,000 two-track line in Yonge St. Another $10,000,000 contract is being let this year, with operation of the whole line expected to begin by the end of 1953. Three miles will be cut-and-cover concrete box section and the remainder will be in open cut.

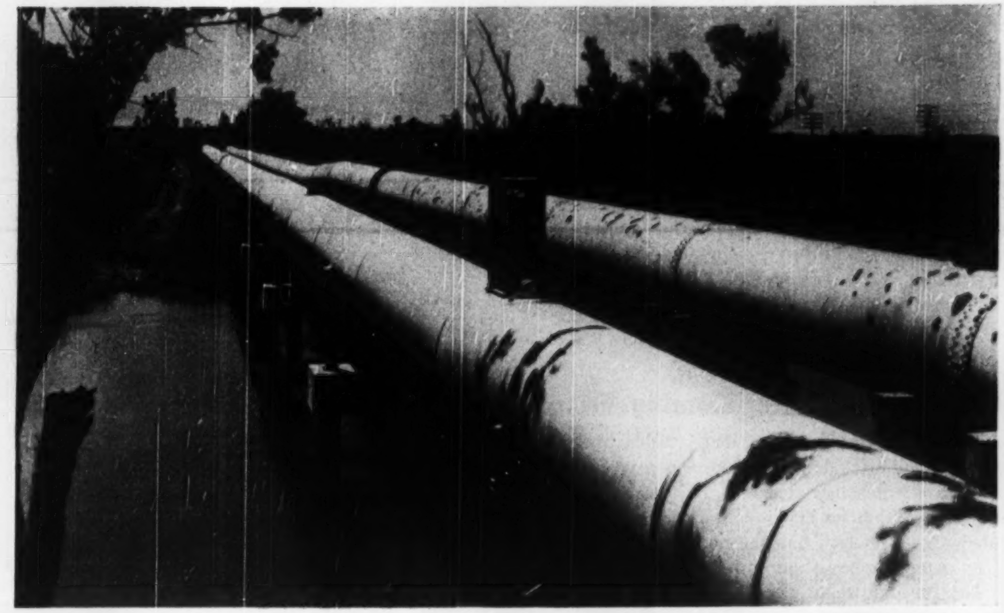
BOSTON AIRPORT—At Logan International Airport, work on the $4,300,000 first-stage apron building and the $1,000,000 heating plant was substantially complete Jan. 1. When apron construction is finished early this year the terminal building will begin to serve 16 plane positions. In its final construction stage the terminal building will serve 40 plane positions, allowing operations on a 1¼-minute headway.

NEW YORK AIRPORTS—Principal 1949 work at **N. Y. International Airport** was in permanent buildings, including a $5,000,000 federal building, completed at mid-year, and three steel-arch hangars, 45% completed Jan. 1. The hangars, to cost $9,200,000, will be finished in May. At **LaGuardia Airport**, a $1,300,000 marginal dike and drain project to prevent field flooding during high tides was fully complete in 1949.

PHILADELPHIA AIRPORT—International (Southwest) Airport, had $7,000,000 of work completed or under contract at the year-end with a $5,000,000 finger-type terminal building remaining for bid; main-runway extension to 7,400 ft is under way.

PIPELINES—In 1949 pipeline construction continued to occupy a significant part of the postwar construction picture, with natural-gas lines predominant. One of the biggest jobs is the 1,840-mi, $200,000,000 **Texas-New York** gas line, begun in the spring of 1949. Preparation for entry to New York includes an under-river crossing of the Hudson, to be made this spring. Another Texas line, to serve cities along the way up **to Ohio**, started in the spring of 1949 and provided service as far as Louisville by December; cost $78,500,000.

Liquid-transmission pipe-line jobs include a $90,000,000 1,150-mi crude line from new oil fields near **Edmonton, Alta., to Superior, Wisc.**, and a 236-mi $15,000,000 oil products line from **Portland, Me. to Montreal, P. Q.** Both were under way Jan. 1, with completion on both expected this fall.



SECOND MOKELUMNE AQUEDUCT (pipeline on left), completed in 1949, is expected to guarantee adequate water supply for years to come for Oakland and surrounding districts. California's East Bay Municipal District owns the facility.

Water Supply and Sanitation

TRULY HEALTHFUL LIVING—the universally popular goal toward which a large segment of the civil engineering profession directs its efforts and dedicates its services—was brought measurably nearer by developments in 1949. All signs point to continued substantial advancement in 1950—in water supply and purification, sewage treatment, pollution abatement and refuse disposal.

Total dollar volume of waterworks construction in 1949 was just over $207 million. The all-time high was established in 1948 at $209 million. Sewage treatment investment at $277 million broke all existing records, 23% above the 1948 figure, continuing the unbroken growth since the war. Because of the high level of costs, however, this outpouring of dollars did not produce the physical volume of works that some prewar years recorded. On a physical volume basis, waterworks contracts in 1949 were only 61% and sewage works contracts 85% of the highest prewar years. A realistic appraisal, therefore, would have to conclude that the health needs of the country are not being met in too-encouraging a manner.

Waterworks: An Economic Appraisal

A NUMBER of factors appear to be operating that will make 1950 a notably satisfactory year in waterworks advancement. Among these may be mentioned: New York City's well-publicized and serious water shortage; the constantly increasing demand by industry as well as municipalities for more water; and a feeling among consulting engineers and municipal officials that costs are to decrease but little in the foreseeable future. These factors seem to suggest that it is neither desirable nor wise to put off new projects much longer.

Based on a survey of new projects that will probably be let this year, ENR conservatively estimates that waterworks construction will total about $210 million in 1950. Among the big projects that will be headlined are: Chicago's $73 million, 950-mgd filtration plant—to be by far the largest in the world; Columbus' (Ohio) Big Walnut Creek 47 mgd supply development; Los Angeles' $25 million investment in reservoirs, 10 miles of large pipe lines and distributing mains; New York's frantic search for expanded supply that will include consideration of a comprehensive plan plus emergency measures; and Hartford's (Conn.) third development that will double the present safe yield of 30 mgd.

A problem facing the waterworks industry is the urgent need for water-rate increases. According to well-informed authorities, such increases are called for not only to offset rising operating costs, but to permit financing of essential new supplies, treatment facilities and distributing mains. As an example of the type of action that must be taken, Atlanta, Ga. has put into effect a 25-percent rate increase that will net about $800,000 a year in additional revenue.

With the objective of bringing order out of chaos, a "Joint Committee on Fundamental Considerations in Rates and Rate Structures for Water and Sewage Works," is continuing to study this confused and complex subject. Sponsored by the American Society of Civil Engineers, the committee is staffed by representatives of the various legal, industry, utility and engineering associations concerned with the problem. The findings and recommendations of this group of co-operating experts will be welcomed by municipal officials plagued by the income-outgo squeeze.

Where's the Water Coming From?

DRIVEN by steadily rising usage, public-works officials are finding it difficult to develop new water supplies that will satisfy demands. Costs rise as cities reach out farther for new sources or tap and treat polluted river supplies. And the number of unharnessed clean-water supplies is diminishing rapidly.

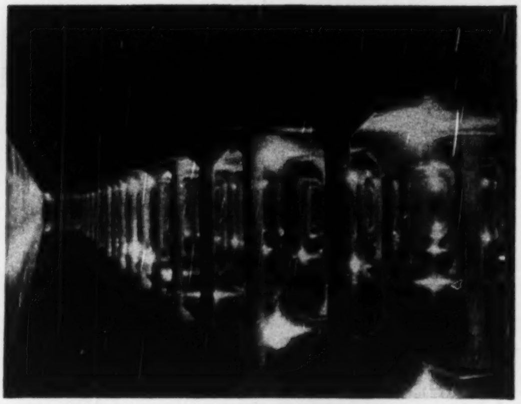
The possibilities of developing additional supplies include four general schemes: More efficient use of water; vast-scale watershed diversions; purification of sea water; and artificially induced rainfall.

Increasing consumption plus new-supply problems makes it mandatory that city officials put into full effect all methods for more efficient water use. Some of the methods that are not fully exploited are: 100-percent metering, waste-water surveys of faulty distribution systems; penalties for household plumbing leaks; return of treated sewage effluents to groundwater supplies (ENR Sept. 1, 1949, p. 172); regulated utilization of private well supplies where available for other than domestic consumption, and scientific control of diminishing groundwater resources.

Great watershed diversions are an accomplished fact in the West. To a lesser extent they are utilized in the East where, however, they are possible in a number of instances.

Distillation of sea water—as a source of municipal supplies—continues to attract the interest of forward-looking engineers. While the present cost of making fresh from salt water—13 to 17 times that of softened water delivered through the Colorado River Aqueduct—improvements in processing are promising. Efficiency of distillation units has increased about eight times since 1941. But one federal official has stated that the "problem is to develop—through extensive research and experimentation—distillation plants with 500 times the capacity and 50 times the efficiency of the largest units manufactured today."

It is interesting to note that a 720,000 gpd sea-water distillation plant (ENR Aug. 11, 1949 p. 30) is being built at Fahaheel, Kuwait (on the Persian Gulf). This plant is feasible, however, because of the high cost of other supplies and the availability of oil for fuel at low cost. Another straw-in-the wind: President Truman has asked for legislation to authorize research for transforming salt into fresh water in large volume at economical costs.

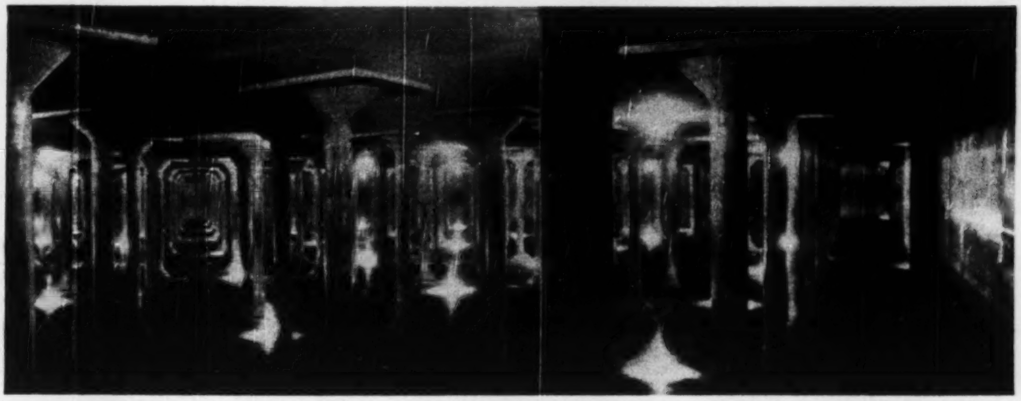

AT DENVER, a 23-mg reinforced concrete box-type reservoir

A few intrepid scientists are continuing to search for better methods of inducing rainfall artificially. Although some experience-based proposals have guaranteed to double yearly rainfall over existing reservoirs, waterworks engineers appear to be viewing this possibility with considerable scepticism. The main reason for not giving rainmaking a trial appears to be the legal question of who owns the clouds and a fear of costly lawsuits that may arise, plus an uncertainty as to results. There may come a time—if water shortages threaten public health, and other water-producing methods cannot be applied quickly enough—when artificial rainmaking may become imperative. It seems logical also that the method should be given a fair, full-scale trial in various climates, before it is cast aside as a water-getting technique.

The overall water-supply picture—reduced to simplest terms—is this: More and more water will be needed by our expanding industrial civilization. And waterworks men—who are alert to water needs—must lead boldly in marshalling public support for additional sources and new practice-proven techniques for purifying readily available supplies.

Advances in Water Quality

LESS SPECTACULAR than big water-supply projects, but none the less important, water-quality improvement and control continue to receive the attention of investigators as well as research-minded plant operators. Fundamental research that is being done today in the laboratories holds promise of improved processing, faster quality control and prevention of some diseases not commonly thought of as being associated with drinking water.



at the Capitol Hill pumping station adds to drinking water storage capacity for distribution. Cost was about $765,000.

Advances in water processing are being made in diatomaceous-earth filtration and development of synthetic resins for water softening. DE filters have been put into operation at Cherry Valley, N. Y. and Mounds, Ill. Designed on the basis of pilot-plant experience, both installations are purifying water for city-wide domestic consumption.

Development of non-phenolic cation resins has resulted in ion exchangers that are reported to give high water-softening capacity with low salt-regenerant consumption. Rapid progress is also being made in the development of highly alkaline anion exchangers that are capable of removing the anions of weak acids.

Procedures for better sanitary control of drinking waters are being investigated by chemists and bacteriologists. To bring about better control through more frequent testing, the primary need is to reduce time required for routine examination. New bacteriological techniques are offering possibilities for development of improved coliform tests. The coliform method may also be improved by use of anitbiotics and sulfonamides that selectively differentiate bacteria. It is not known at this research stage, however, whether or not these substances will eliminate undesirable forms without repressing coliform organisms.

Application of the electron microscope to water-quality problems continues to be limited to research activity. Training of personnel, questions as to interpretation of micrographs, and its present stage of refinement prevent utilization of this instrument for routine examinations.

A pioneering achievement sponsored by the U. S. Public Health Service is the fluoride-removal plant at Britton, S. D. (ENR Jan. 19, p. 40). By reducing fluorides from 6.7 to 1.5 ppm in drinking water, this plant promises substantial reduction of mottling of children's teeth without eliminating the fluoride residual needed for tooth protection.

The practice of dosing water supplies with fluorides to inhibit dental decay, on the other hand, is being adopted rapidly—perhaps too rapidly. Informed opinion seems to agree that public officials should proceed with caution when considering addition of fluoride to municipal water supplies. Long-range full-scale controlled investigations—such as that at Kingston and Newburgh, N. Y.—have not been concluded, and the full range of effects of such medication are not defined.

Another forward step in public-health protection is the investigation and development of limits for nitrates in water supplies for prevention of methaemoglobinemia in infants.

Sewage Works Construction

IN SPITE of the high-cost hurdle, many large sewage projects are underway. Some of these are: Boston's Nut Island, to be in operation by 1951; New York's Owl's Head, Hunt's Point and 26th Ward; Los Angeles' Hyperion; Philadelphia's Northeast, Southeast and Southwest works; and Chicago's West-Southwest plant. Large expansions are in progress at Baltimore, Md. and Columbus, Ohio.

Steadily rising costs are embarrassing municipal officials and engineers who have completed plans and estimated costs for conditions existing several years ago. Bond issues approved in the past often are not supplying sufficient funds to complete projects. A case in point is that of The Sanitary District of Chicago: A $100-million issue is nearly exhausted, and upon request of the District the state legislature has authorized an additional $21 million without referendum to finish construction.

High costs and limited bonded debt are directing managerial thought towards novel engineering designs that call for less investment. An example of this practice is at Buffalo, N. Y. where a storm-water system utilizing a retention basin was constructed at about one-half the cost of full-capacity sewers.

Municipalities, pressed by regulatory agencies and state health departments, are searching for new methods of financing. Mentioned most often is the authority type of organization. Authority indebtedness is generally not included in the constitutional limit and can be defrayed by collection of sewer charges. An example of this type of organization is the recently authorized Bergen County, N. J. Sewer Authority. With approval of a $11,800,000 bond issue, this Authority will go ahead with the Overpeck Valley sewerage project in the New York metropolitan area.

In Indiana, on the other hand, sewage-works improvements are blocked by a decision of the State Supreme Court that characterizes special districts as a subterfuge for getting around the legal debt limit. Construction progress in this state awaits decision of a second court case.

Sewage plant operating and maintenance costs also are up sharply. A study of expenditures by the Sanitary District of Chicago reveals operation and maintenance for its four major works in 1948 cost 1.7 times that of 1941. This rise is attributed mainly to coal-and-chemical price increases and to the advance in labor costs.

Advances in Sewage Processing

FOUR MAJOR TRENDS are discernible in the field of sewage treatment. These are: Sporadic attempts to develop high-quality high-rate processing that will cut construction costs for large projects; intensified interest in remodeling existing facilities to handle increasing flows; a growing awareness of the need for bargain-priced designs that can be financed by debt-burdened small cities; and better plant performance to meet standards being set up by pollution-control agencies.

Viewed skeptically by some engineers, but perhaps holding promise of quality treatment plus low construction cost is the experimental plant at Daytona Beach, Fla. (ENR Feb. 16, p. 38). This high-rate chemical precipitation plant, utilizing a low-cost coagulant, consists of one upflow combined flocculation and sedimentation tank and one vacuum filter. To serve 70,000 people it was built at a cost of $4.70 per capita. Short periods of near-normal operation seem to indicate that the performance bond will be satisfied. But it is important to note that the facility has not yet received the approval of Florida's state board of health.

Stepping up treatment capacity is exemplified at Baltimore's Back River works. By superimposing rotary distributors on fixed-nozzle trickling filters, about 40-percent more sewage is being handled successfully. Operation of the plant has also been improved by installing sludge-removal and scum draw-off equipment in one of the final settling tanks. These devices result in more treatable sludge and lower cost of tank cleaning. Both improvements were built at a cost estimated to be one-quarter of that needed for equivalent conventional facilities.

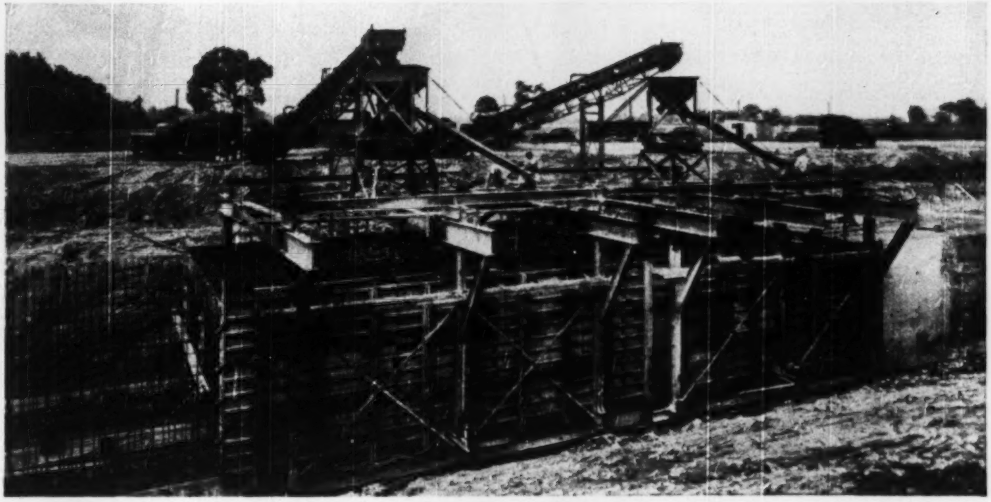
Construction of several low-capacity plants in Virginia and Maryland seems to indicate a resurgence of interest in the contact-aeration process. Early performance checks suggest that the process will produce high-quality, odor-free effluent if properly designed and operated. Construction costs are reported to be about $25-29 per capita for populations ranging from 1,000 to 3,500 persons.

Initial operating experience at the Columbus, Ohio aerated grit chamber (ENR April 28, 1949, p.56) suggests that this facility may be performing its function more effectively than anticipated. Collection of data over a longer period of time is required, however, before the performance can be decisively evaluated. Replacement of plate by tubular air diffusers at the same plant has also resulted in better aerator efficiency.

Pollution Abatement Progress

STATE AND INTER-STATE agencies are driving forward to promote—and in some cases compel—stream-pollution abatement. Indications are that these agencies will meet with more immediate success when dealing with industrial-waste pollution than with the more important problem of municipal sewage. Industry is aware of the value of maintaining public good-will; cities find it convenient to delay construction of unprofitable sewage works as long as possible.

AT BOSTON, the 300 mgd Nut Island sewage works, including sedimentation, aeration and sludge-digestion tanks is 75 percent complete. Project cost is $6,500,000.



AT DETROIT, big sewers were built by mass-production methods, with special forms, ready-mixed concrete, highly mechanized equipment. Sewers ranged in size from 14.25 ft ID to these 12.25x14.25 ft double-box culverts.

Several significant developments in pollution-abatement promotion may be noted. The Connecticut Water Commission has listed sources of pollution according to severity, and is attacking the problem on a group basis. The Interstate Commission on the Potomac River Basin has called attention to the importance of natural pollution arising from soil erosion. The Ohio River Valley Water Sanitation Commission has set high-quality standards for the Cincinnati pool, pursued phenol-waste-elimination studies, and alerted all cities and industries in its jurisdiction of its existence and the requirements for compliance with the eight-state compact. The New England Interstate Water Pollution Control Commission and the N. Y. State Water Pollution Control Board have been activated. The California and Indiana programs are stymied by legal hurdles.

The position of the U. S. Public Health Service in water-pollution control remains to be clarified. Concern is being expressed in responsible quarters about its relation to state agencies, its duties and authorities. Some officials fear growth of a tremendous federal staff, question the value of ten river-basin organizations to deal with local problems already well understood by state authorities, and suggest that state's rights may eventually be undermined by these activities.

Nuclear Fission Wastes

THE IRON CURTAIN of secrecy that surrounds handling and treatment of radioactive wastes is gradually being penetrated. Progress in this respect is due primarily to the relentless efforts of outstanding sanitary engineers, public-health men and the technical press. They feel that complete facts about atomic wastes and existing treatment methods should be made available to the profession, and that training procedures should be extended to give practicing sanitary engineers the scientific bases needed for dealing with radioactive materials.

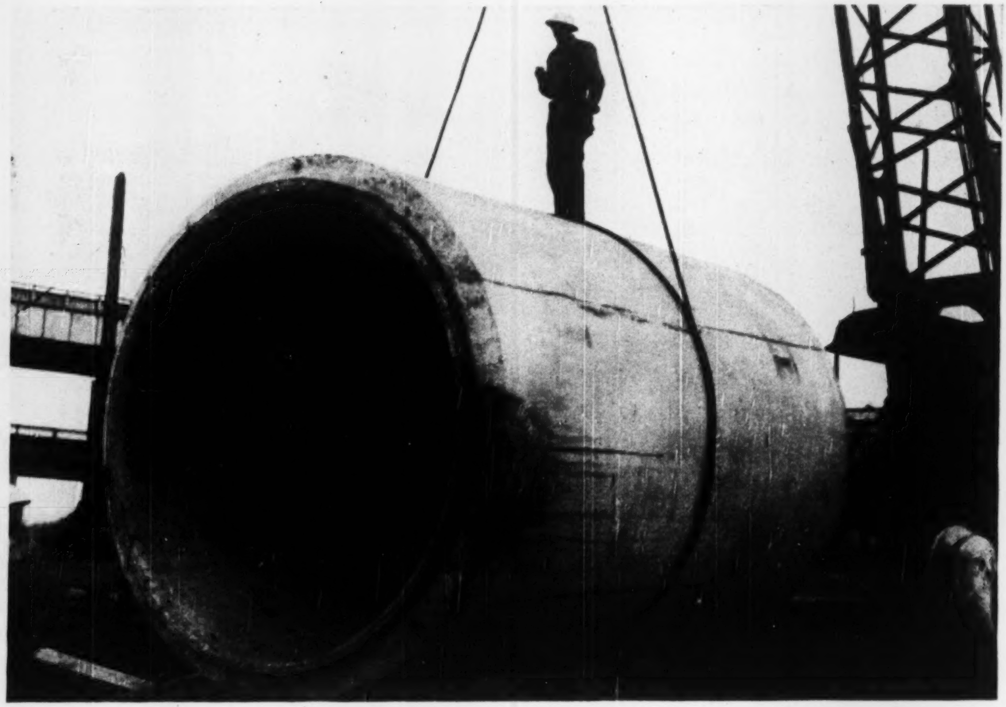
As a starter, the Atomic Energy Commission conducted a two-day seminar for 55 sanitation specialists on fundamental topics connected with radioactive-waste disposal. It also issued a report analyzing, coordinating and developing information presented at the seminar.

Gleanings from available literature and informed comment indicate that gratifyingly rapid progress is being made in development of methods for disposal of radioactive wastes.

Malaria-Mosquito Control

INITIAL SUCCESS in stamping out malaria mosquitoes on the Mediterranean island of Sardinia by mechanized methods is being checked by refined scientific techniques. In-progress findings appear to indicate that the annihilation campaign as well as continuing preventive measures—such as DDT house spraying and relentless search for small residual breeding spots—will result in attainment of the aims of this vast pioneering experiment.

Outstanding progress in malaria reduction is also reported in the Tennessee Valley Authority's region. Due to continued application of engineering, biological and medical control methods, no positive blood smears were found last year in areas with a former high incidence of malaria. Engineering techniques that contributed to wiping out the disease-transmitting mosquitoes were: Water-level fluctuations, widespread larviciding and adulticiding, drainage works and low-



AT OAKLAND, an outfall serving it and 5 other cities includes 108-in. dia pipe on land section. Completion of $24,000,000 project will stop pollution of San Francisco Bay by sewage discharge from cities bordering the area.

area fillings. Time-consuming, costly, manual spreading of paris green and oil on breeding spots was replaced by airplane application of DDT in the later stages of the work.

Despite the success of DDT in eliminating mosquitoes, research aimed at finding better insecticides has continued. Production of numerous homologues of DDT—some of which have better properties than DDT itself—promise to make spraying campaigns more effective and less costly.

Sanitation For Point 4

LOUDLY TRUMPETED is the economic and political groundwork needed for developing the world's backward but potentially valuable areas. While economic and political problems must be solved before work can begin, sanitation has not been accorded its experience-proven place in the overall method of attack. Harvard's Gordon Fair has issued a call to arms: "Point Four of President Truman's bold new program will succeed only if sanitation is recognized as the essential advance guard for developing backward areas." This admonition is backed up by the work of the Institute of Inter-American Affairs and the Rockefeller Foundation, and the successful campaigns to eliminate malaria mosquitoes both in Brazil and in Sardinia.

Garbage Grinders

SALE OF GRINDERS that discharge kitchen garbage to sewers is being promoted with vigor. But their installation is prohibited by at least 19 municipalities. The New Jersey State Department of Health has recorded its disapproval of such equipment because of additional load placed on existing sewage works and possible stream-quality damage at cities without treatment facilities. Experts estimate that widespread utilization of garbage grinders may increase sludge loadings as much as 300 percent and that of oxidizing units 30 percent. Although GG installations will undoubtedly increase steadily because of their convenience and cleanliness, it is important to note that not only will treatment-plant costs rise, but also refuse-collection systems will not be eliminated with their introduction.

Refuse Collection and Disposal

A SIGNIFICANT DEVELOPMENT in refuse-collection practice is that public officials are becoming aware of haphazard rule-of-thumb direction and are taking steps to utilize the know-how of engineering administrators.

Design of refuse-collection truck bodies continues to improve. Experience is pointing up the fact that different body designs are required for collection in densely populated and in suburban areas; speed of loading is essential in the first case to prevent traffic congestion. Truck-loading mechanisms are being confined to one point so that a whole damaged unit may be removed and replaced in the field easily and quickly. Another trend is towards increased yardage as well as greater weight capacity in collection units.

Enlarged bodies in turn are affecting incinerator-plant designs. Greater horizontal and vertical clearances are required in tipping rooms to accommodate newer units. Wider pits, higher tipping clearances and larger charging chutes are also called for by this equipment-size enlargement. Attention continues to be focussed on improving in-and-out material-handling facilities and residue quenching at incinerators.

Increasingly it is being recognized that disposal of residue from incinerators must be anticipated in design. Planned landfill is called for to dispose of non-combustibles and burned residues.

Remodelling of existing incinerators—installation of up-to-date material-handling equipment, furnace improvements and refuse-storage pits—is a comparatively new field of activity.

Incinerator projects are reportedly being held back in New York State by a law stipulating amortization in 15 years. This limit compares to 30 and 40 years for sewage and water works and establishes first-year debt service at about nine percent of project cost, a discouraging hurdle.

Two encouraging signs are appearing in connection with commonly used but disapproved refuse-disposal practices. Many former open "dumps" are being converted to semi-landfill. This development is attributed to manufacture of machinery that makes semi-landfill procedures reasonably feasible. In addition, certain instances suggest that hog-feeding farms for garbage disposal will disappear gradually, not because of health considerations but of extreme nuisance.

Landfill practices appear to be improving as a result of more efficient operation and engineering planning and supervision. Also, it is being appreciated that successful landfill requires suitable material for cover. Good cover is said to be porous, and equivalent to that used in road building, so that heavy equipment can be supported in wet weather.

Other methods of garbage disposal—composting and digestion—may be proved or discounted by projects underway and several years of operation. These methods are not complete solutions to the refuse problem because only organic materials are disposed of. Other procedures must be employed to take care of non-combustibles and inorganic refuse.

Some Major Waterworks Projects

DENVER, COLO.—A five-year waterworks expansion program is in progress. Completed last year were: A 23-mg RC box-type distribution reservoir; A 5.5-mg RC basin that increases clear-water storage at Moffat filter plant to 15.5 mg; $3,000,000 90-in. pipeline (3,000 ft in tunnel) to convey water from the South Platte River 10 miles to Marston Lake, a reservoir that feeds two filter plants; and $800,000 worth of 24-, 36- and 42-in. feeder mains in the city. Proposed construction for 1950 includes: A 7-mg settling basin and re-arrangement of raw-water piping at the Moffat plant; a 54-in. 9-mi conduit from Ralston Reservoir to the Moffat plant to cost $1,616,000 that will double delivery of water; A 60-in. $1,200,000 main from Moffat to the city; and commencement of the dam on the South Boulder Creek, 35 miles west of Denver. To impound 40,000 acre-ft, this project will cost $14,000,000 of which nearly 11 percent will be expended this year. Work will also be started on the St. Louis Creek diversion program.

HETCH HETCHY AQUEDUCT—San Francisco's water supply will be increased by 25 mgd in April when 33 miles of a second line across the San Joaquin Valley from the city's Hetch Hetchy project is looped into present aqueducts. When the rest of the $12,000,000 San Joaquin line—47.5 mi long, 61-in. dia.—is completed sometime in 1951, the new system will carry 76 mgd. Work on a line around the south end of San Francisco Bay supplementing two present conduits under the bay started early in 1950 for completion in mid-summer, 1951. The 34-mi bay by-pass will be 72-in. dia. and carry 76 mgd.

LOS ANGELES, CALIF. — Water distribution capacity in Los Angeles will be increased by 15% by completion (most units in 1950) of the following: The $2,500,000 Baldwin reservoir and its $5,000,000 inlet and outlet lines; the $1,000,000 Griffith Park to North Hollywood conduit and 2.5 mg storage in the Santa Monica Mountains ($230,000).

MARIN COUNTY, CALIF.—Voter approval late in 1949 launched a 5-year, $4,000,000 expansion program for the Marin Municipal Water District serving nine municipalities and uncorporated areas just north of San Francisco. Major units in the program are a filter plant and a storage dam, both scheduled for construction in 1951. The 1950 program includes 7,000 ft of 36-in. line, 40,000 ft of 24- and 16-in. transmission line and other miscellaneous work.

MOKELUMNE AQUEDUCT—The supplementary 81-mile long line was completed and went in service in mid-year. Built at a cost of $22,000,000, it adds 50 mgd capacity to the East Bay Municipal Utility District System serving Oakland, Calif., and surrounding area.

PHOENIX, ARIZ.—The $6,000,000 water system expansion was completed in 1949 except for the installation of spillway gates at Horseshoe Dam and this work is well along toward completion.

SAN DIEGO, CALIF.—Construction of the 66-mgd Alvarado filtration and softening plant and of major transmission mains is about 50 percent completed. Practically all work under $4,500,000 bond issue approved by voters in 1948 will be completed by the end of 1950. In 1949, the San Diego Aqueduct delivered 23,000 mg of Colorado River water to the San Diego area. Water storage in city reservoirs gained 2,000 mg during the

AT TAMPA, new upflow-settling units, chemical-feed facilities, steam-generating additions and pumping improvements up capacity to 32 mgd.

past year due to 10 percent above-normal runoff and importation of Colorado River water. General drought conditions are still serious except for the agencies entitled to Colorado River water.

SOUTHERN CALIFORNIA—The Metropolitan Water District of Southern California completed in August, 1949, the expansion from 100 to 200 mgd of the La Verne softening and filtration plant at a cost of $3,840,000. Lateral pipe line work totaling $2,400,000 was substantially completed in 1949 by the MWD to serve San Marino, Compton, Long Beach and the West Basin Municipal Water District.

AKRON, OHIO—Major items under construction for rehabilitation of the 34-year-old steam-operated water-treatment and pumping station include: A 60-in. conduit and low-lift pumping station for raw water; a storage building and handling equipment for chemicals; two 40,000-lb per hr boilers; a new 20-mgd pump and two 500-kwh generators. The $3,600,000 project is about 45-percent complete. Work contemplated for 1950 is: A 5-mg underground reservoir, three miles of feeder mains, and an additional standpipe.

CHICAGO—Waterworks construction and maintenance were restored to near pre-war efficiency last year but appropriations this year will not be sufficient to permit adherence to the proposed modernization schedules. New pumping units to be delivered this year will be stored until installation funds are available. The South District Filtration Plant was completed, except for landscaping, last year and is operating at capacity. Following approval of site, design of the 950-mgd North-Central filtration plant is going ahead rapidly. New boilers and other improvements at the Springfield Ave. pumping station will be completed next year. Last year, 21,600 ft of 36-in. and 13,200 ft of 24-in. distributing mains were installed in the South District, costing $700,000. An additional 16,000 ft of water line is planned for that area this year. The cost of this installation will be approximately $440,000.

CLEVELAND, OHIO—Five contracts totaling $17,850,000 for the 100-mgd Nottingham filtration and treatment plant on the east side of the city range from 4% to 99% completed. The 3.5-mi, $4,262,000 lake section of the 10-ft dia intake is 78% completed, while the 1½-mi section of shore section, costing $1,845,000, is 99% finished. At the filtration plant a $3,237,000 contract for pump building and pumps, machine shop and garage, is 4% completed. But the $5,951,000 administration building, chemical and filtration buildings including filters, are 31% finished. A $2,554,000 contract for the rapid-mix tanks, flocculation and settling basins is more than 50% completed. Present plans call for the plant to go into operation some time in the fall of 1951.

DECATUR, ILL.—Tentative contracts have been awarded, based on the expected approval of a Water Revenue Bond Issue, for initial construction in a $2,075,000 waterworks improvement program. All pumping equipment will be electrified, replacing present steam pumps and boilers. Contracts tentatively awarded include a 1.5-mgd elevated storage tank, high- and low-lift pumps, a 560-kw diesel generator, a recarbonization unit and other plant additions. Contracts for 16 miles of water mains, estimated to cost $617,200, will be awarded this spring.

DETROIT, MICH.—Total volume of waterworks construction completed last year was $4,585,000. It included a 30-mg reservoir; a temporary booster pumping station at the proposed Northeast Station; 21,620 ft. of 42- to 66-in. water mains, 1,300 ft of which were built in tunnel; $558,000 worth of 6- to 16-in. distribution mains; and $944,000 worth of new service installations. A $1,471,000 contract for the first section of raw-water tunnel to the Northeast Station (5,850 ft) was awarded last year. By the end of the year it was 25% completed. A lump-sum contract of $5,588,000 is being awarded for the remaining four sections of this project, involving 20,770 ft of 10-ft tunnel. Contracts to be awarded this year include: $4,000,000 for plant construction and equipment at the Northeast Station; $770,000 worth of 30- to 60-in. transmission mains, totaling 20,580 ft; $440,000 for 10,500 ft of 54-in. transmission main; and a $250,000 prechlorination station to disinfect raw water flowing to all treatment plants.

EVANSTON, ILL.—Construction contracts for increasing capacity of the water-filtration plant from 24 to 48 mgd were 81% complete at the end of last year. Completion is scheduled for May 15. Total cost of the project is $2,910,000. Plant additions include: new mixing and settling basins; 24-mgd filters; electric high-service pumping station; conversion of old settling basins into reserve filtered-water storage; and conversion of the old boiler plant to a water-service building.

FREMONT, OHIO—Planned for award late this summer and completion next year is a $730,000 waterworks improvement program. It includes an elevated-steel-storage tank of either 300,000- or 500,000-gal capacity; distribution mains of 8-in. to 16-in.; and a 3-mgd addition to the existing filtration plant including four filters, settling basins, clearwell, additional high- and low-lift pumps and allied equipment.

LOUISVILLE, KY.—Last year the Louisville Water Co. spent $534,600 on electric pump installation, installed 41,200 ft of 6-in. and 8-in. distribution mains for $137,000, and 2,200 lin ft of small service lines for $156,000. This year the company will complete the electric pump installations at a cost of $281,000; spend

$100,000 for more 6-in. and 8-in. mains; $135,000 for service lines and meters; and $110,000 for miscellaneous improvement items in its water system.

MOBILE, ALA.—To yield 100 mgd, a $7,000,000 water-supply project—dam and impounding reservoir—is under way on Big Creek, 16 miles west of Mobile. Contracts have been let for manufacture as well as installation of the 48-and 60-in. reinforced-concrete transmission main to the city. Total cost of the main is about $2,400,000.

TOLEDO, OHIO—The 10-year waterworks improvement plan, to be completed by 1960, includes $350,000 for water-softening facilities and $5,000,000 worth of additions to the present distribution system. These water mains will vary from 16 in. to 72 in. in diameter. A contract will be let this year for a 24-in. line from Bancroft St. to Groveland, estimated to cost $160,000. Work completed or placed under contract last year includes: A 65-mgd high-service pumping unit for $158,600; a 36-in. eastside trunk main costing $350,000; cathodic protection of an elevated-storage tank; and a 6,000-lb chlorine feed machine with evaporator and residual recorder.

BALTIMORE, MD.—The first and second sections of a tunnel to the Patapsco River supply are 99 and 85-percent complete. Cost of the work will approach $19,000,000. Connections and controls at the Montebello filtration plant, to cost a total of $356,000 are at the three-quarter stage. Underwater installation of a 48-in. main costing $1,866,000 has now reached the half-way point in construction.

BOSTON, MASS.—The $9,500,000 City Tunnel section of the Hultman Aqueduct was 70-percent complete at year's end. Completion of lining in the 5.5-mile, 15-ft dia. tunnel and shafts is expected to permit operation in June 1950. Construction of the Chicopee Valley Aqueduct, including more than 13 miles of 36- and 48-in. RC steel-cylinder pipe and a 25-mgd open reservoir is approaching completion. At a total cost of about $4,000,000, the aqueduct will deliver water from Quabbin Reservoir to Chicopee, Wilbraham and other cities early in 1950. Legislation has been enacted authorizing a 25-mile aqueduct to convey water from the Wachusett Reservoir to Merrimack Valley cities. Construction will proceed if the city of Lowell decides to take its supply from the Metropolitan District. Scheduled for completion this summer are the 110-mg Blue Hills open reservoir and a six-mile 48-in. main to Quincy and other southern parts of the District. Total cost of this work is $2,330,000.

CHESTER, PA.—A new water-supply system is under construction. Costing about $14,000,000, the project includes a dam and 2.5-billion gal. reservoir on Octoraro Creek, an 18-mgd filter plant and pumping station, 39 miles of 24 to 42-in. transmission conduit and four storage reservoirs. The dam, reservoir site and filter plant are complete. Pipe-line constrnction will begin about May 1950. Contracts for two 2.5-mgd and two 10-mgd distribution reservoir will be let during the year.

NEW YORK CITY—The Board of Water Supply plans to start impounding water in Rondout Reservoir behind Merriman Dam late this year. This is stage 1 of the Delaware system. Meanwhile, installation of permanent operating equipment in the 85-mi Delaware Aqueduct, joining Rondout Reservoir with city tunnels, is 70 percent finished with a 1951 completion date and a $2,800,000 total cost. West of the Delaware-Hudson divide, work is being rushed on stage 2 reservoirs, and the delivery tunnels to join them with Rondout. Neversink Dam is 43 percent complete with a $13,800,000 spent so far and $32,000,000 to be spent in all. The 5-mile Neversink-Rondout tunnel is 10 percent finished and is to be finished in 1952 at a total cost of $15,000,000. At Pepacton Reservoir, Downsville Dam nears 34 percent completion; $11,000,000 of its $32,000,000 cost have been spent so far. In 1950 rolled earth fill will start while work continues on 25-mile Pepacton-Rondout tunnel. The $44,000,000 tunnel has been under contract since last August and is 2 percent finished with a 1955 completion date scheduled.

PHILADELPHIA, PA.—The new Torresdale filtered-water pumping station is in operation. Costing more than $1,677,000 the completely electrified station has 215-mgd capacity. Rehabilitation of the Lardners Point pumping station is at the half-way point. To be completed in 1952, this $1,600,000 project also provides for complete electrification of the station as well as four new dual-purpose and two high-level conventional pumps. A $2,640,000 contract for a 120-mgd, 4-hr detention pre-treatment unit at the Queen Lane filter plant was let late last year. Proposed for 1950 is a chemical house and feed equipment at this plant that will cost $1,500,000. The $864,000, 1,250-lb per day ozonation plant completed last year is treating up to 36 mgd at the Belmont Filter plant.

TAMPA, FLA.—In construction improvements to the water-treatment plant totaling more than $2,000,000 (including units already built) are: Two 35,000-lb per hr boilers, a 25-mgd steam-driven high-service pump; a 20 mgd steam-driven raw-water pump; reconditioning of two 10-mgd high-service and two 10-mgd raw-water pumps; machine shop; and 20,000 bbl oil-storage tank. Completion of improvements is scheduled for the summer of 1950.

Sewage Disposal

BOISE, IDAHO—Completion of the 10-mgd activated sludge plant originally scheduled for Sept. 1949, was delayed until Feb. 1950, by bad weather and a Boise area labor strike. The plant is part of a $1,500,000 program that also includes extensive interceptor work.

BREMERTON, WASH.—Completion is scheduled this summer on two sewage plants, several miles of 18 to 24-in. pipe and nine lift stations for which contracts totaling $1,200,000 were awarded last year. Designed for 45,000 population, the system will serve Bremerton, Wash., site of a large Naval shipyard across Puget Sound from Seattle.

HONOLULU, T. H.—Some $5,000,000 of a 10-year, $23,000,000 sewerage program started in 1947 is now complete or under construction. Completed are a pumping plant, a 6,000-ft. tunnel and 37.5 miles of new sewers. Projects planned for 1950 total another $3,683,000 including a 79-in. dia outfall extending 3,600 ft offshore.

LAKE CITY, WASH.—The first $165,000 contract was awarded in 1949 for what has been termed "the nation's largest suburban sewer project" in the Lake City Sewer District just north of Seattle, Wash. Work to be placed under contract in 1950 is estimated at more than $2,000,000 and will include the first 2.5-mgd unit of a 7-mgd activated sludge plant, ¼ mi of 7.5-ft tunnel, 2 mi of 27- and 30-in. trunk sewers, 300,000 ft of 8 to 15-in. laterals, 11 pumping stations and 1-mi effluent line and outfall. The $7,500,000 project cost will be spread over a five-year period.

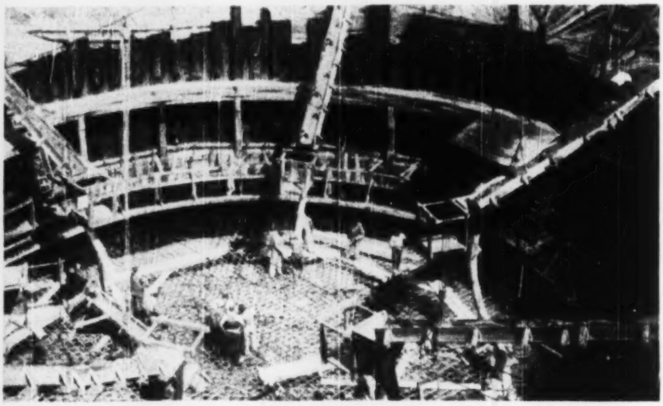
LOS ANGELES, CALIF.—Progress on the $41,000,000 high-rate activated sludge plant at Hyperion (245 mgd capacity) includes completion of contracts totaling $8,600,000 in 1949. Most important of these were the headworks and outfall, permitting discharge of chlorinated sewage a mile off shore. Other contracts showed the following completion percentages on Jan. 1, 1950 (figures in parentheses are contract amounts): Primary settling system 99% ($3,613,900); digestion system 99% ($3,991,000); filter, drier and fertilizer storage system 63% ($6,300,100); power and blower plant 91% ($3,583,600); general piping 69% ($1,049,600); power and light distribution 11% ($1,151,700); filter and drier stack 26% ($232,100); aeration system 33% ($2,917,300); final settling system 22% ($3,253,300); warehouse and shops 8% ($418,100); administration and laboratory 6% ($478,700); and influent connection 21% ($320,000). The concluding contracts will be let in 1950 for elutriation and sludge concentration and landscaping.

OAKLAND, CALIF., VICINITY—Emphasis in 1949 was on interceptor construction with 8 miles of the 21-mi total completed and 6 more miles under construction. In 1950, work will concentrate on the treatment plant and outfall. The latter is 20% complete under two contracts totaling $2,954,988. Main pumping station and grit chambers are about half done and work has started on the effluent pumping station. Bids will be called early in 1950 for the administration and laboratory building and sedimentation basins. Other plant units will get underway in 1950. The entire $24,000,000 program of interception and treatment is scheduled for completion late in 1951. Administering agency for the six California cities is Special District No. 1 of the East Bay Municipal Utility District.

OMAHA, NEB.–One big sewer project has just been completed and two others will be built this year. The completed project in South Omaha, costing $2,143,000, involves 7,360 ft of monolithic reinforced-concrete sewer; all but 500 ft of which is 12 ft and 13 ft ID. The second project (Benson Sewer) is 9,850 ft long and estimated to cost $1,177,000. It will be a 7-ft circular section with a twin 7½x7½-ft box outlet. The third big project (Burt-Izard Sewer) will include 610 ft of 5½-ft dia pipe and 390 ft of 6-ft pipe.

ORANGE COUNTY, CALIF. — A $4,500,000 trunk sewer, ocean outfall and treatment plant construction program for seven Orange County sanitation districts was delayed in 1949 by organizational difficulties. Construction may start in 1950 but officials won't say when until all the red tape is untangled.

PORTLAND, ORE. — Construction is nearing the half-way mark on Portland's $16,000,000 sewage disposal project. Completed in 1949 were a 1.5-mi outfall sewer tunnel and a second 0.5-mi section which will carry treated sewage from the treatment plant now under construction to the Columbia River. Construction is under way on the main 3.25-mi interceptor tunnel. Contracts totaling $7,404,000 have been completed, are under construction or have been placed for equipment. Completion of the project is set for mid-1952.



AT PHILADELPHIA, the $800,000 pumping station to serve the 140-mgd Southwest sewage works, is under construction.

SACRAMENTO, CALIF.—Size of a new treatment plant will be determined when the city reaches agreement with outlying districts expected to participate. If all come in, a 54-mgd primary treatment plant will be built with bids received late this year or early next. The city has available $1,100,000 in state grants that must be matched by like amounts of city funds.

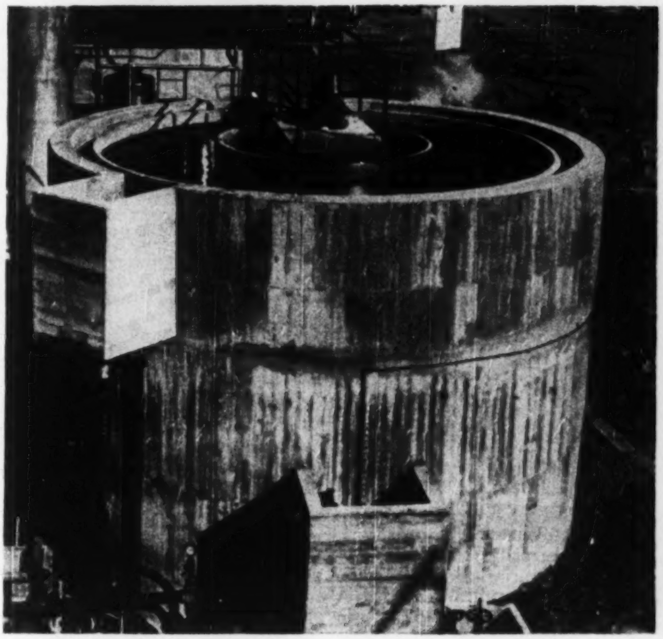
SAN FRANCISCO, CALIF. — In 1949 San Francisco showed good progress in its sewage-treatment program, aimed at stopping pollution of San Francisco Bay. Contracts in effect showed the following completion percentages in Jan. 1950 (figures in parentheses are contract amounts): North Point plant 38% ($8,289,525); influent and effluent lines 1% ($1,039,903); sludge plant at Islais Creek 8% ($4,486,000); southeast plant 0% ($2,132,118); and crosstown sludge lines 33% ($388,180). The North Point plant has 65-mgd capacity and the southeast plant has 45 mgd; both are sedimentation units with all sludge treated at the Islais Creek sludge plant.

SAN JOSE, CALIF.—Detail designs for a plant involving primary treatment followed by oxidation ponds are well under way. Some preliminary construction will start this year should a $3,930,000 bond issue pass successfully on May 15. Heavy canning load in late summer months dictates that plant be designed for 35-mgd average flow for the maximum month.

STOCKTON, CALIF.—A $1,330,000 contract was completed in 1949 for a portion of a 20-mgd, high-rate trickling-filter plant. This year an additional filter will be added together with the necessary secondary sedimentation facilities.

SUBURBAN SEATTLE, WASH.—Work started in 1949 on a $1,450,000 sewerage system for the Greenwood Ave. Sewer District, in a 9,000-acre suburban area just north of Seattle bordering on Puget Sound. With completion scheduled this year, the project involves a primary treatment plant to serve an ultimate population of 60,000 people, 57 miles of 8-in. laterals, and more than 2 miles of trunk lines as large as 27 in.

TUCSON, ARIZ.—With award of a $1,100,000 contract early in 1950, construction of a 12-mgd activated-sludge plant has started. Scheduled for completion in March, 1951, the plant will handle 125,000-population flow. Low flow in streams receiving plant effluent made secondary treat-



IN INDIANA, wastes from the Rock Island Refinery are oil-separated, chemically flocculated and settled. Effluent is aerated, held in lagoons before discharge.

ment necessary. Tucson previously had primary treatment only. The new plant is designed to handle present and anticipated future sewage flows from Tucson proper and also from the surrounding suburban area in which Sanitary District No. 1 of Pima County is now installing a comprehensive system of main sewers.

WASHINGTON — Considerable progress in controlling water pollution has been made under the direction of the state's Pollution Control Commission. Last year 18 sewage-treatment plants—serving 235,000 people and costing more than $4,000,000—were put under construction. Primary-treatment plants are located at Bremerton, Bellingham, Vancouver and the North Beach and Greenwood Avenue sewer districts, north of Seattle. A large bio-filtration plant is in operation at Richland. The year 1950 will see a large number of additional plants under way. These will include Spokane, where trunk sewers are now being constructed and a treatment plant designed for a construction start in 1951. Tacoma's primary-treatment facility should be started this summer. The state's largest activated-sludge plant is in progress for the Lake City sewerage district, north of Seattle. Plans have been approved by the Commission for 17 other small city plants.

With recent issuance of orders to four major sulfite-pulp mills to cease pollution by waste liquor by Sept. 1951, the Commission has attacked the problem of industrial wastes. An outstanding forward step in recovery of sulfite-waste liquor is the magnesium process developed by the Weyerhaeuser Timber Co. at Longview. A full-scale plant—that substitutes magnesium for calcium in preparation of sulfite cooking liquors and makes recovery of the chemical and burning of the residue possible—has been built at a cost of $5,000,000. Operation of the unit is reported to be satisfactory.

An industry-wide program of waste prevention has been initiated by the commission. Its purpose is to demonstrate that pollution problems can be minimized by careful control of manufacturing processes. When the program becomes effective, results will be reviewed and industries which continue the discharge of pollution materials will be required to build treatment facilities.

AKRON, OHIO—Improvements to cost $3,000,000 are under way at the sewage-treatment plant. Sludge digestors and sludge incinerators are being built for about two-thirds of this amount. An incinerator building to cost about $1,000,000 will be erected in 1950.

BIRMINGHAM, ALA. – Although present population is only 500,000 the new sewage treatment program is designed to serve 700,000 persons, estimated for the year 1965. And its collection system is designed for the year 2,000 when population of metropolitan area (now 50% greater than the area of Chicago) is estimated to be 1,000,000. Estimated cost of the program is $17,000,000–divided about equally between collecting sewers and sewage-treatment facilities. Plans have been completed for the $5,000,000 main Village Creek sewer, and 1½-mi of 66-in. tunnel to divert sewage to Village Creek, to cost about $1,000,000. Plans are under way for a 16-mgd primary-treatment plant and a 40-mgd activated-sludge plant. About $10,000,000 worth of construction contracts will be awarded this year, with program completion scheduled for the end of 1951.

CHICAGO, ILL.–Nearly 8 miles of sewers were built by the city last year at a cost of $5,250,000. This year, an additional $20,000,000 worth of sewers will be placed under contract in 8 major sewer systems. An additional $5,000,000 worth of work is now under contract. Most of the sewers to be contracted this year are big ones; ranging up to 16½-ft dia. They are auxiliary sewers to carry the overload of existing sewers during periods of heavy run-off.

CHICAGO SANITARY DISTRICT –Over 20 mi of storm-relief sewer contracts awarded during the past 3 years were completed last year at a cost of $49,620,000. Work also was finished on $14,160,000 worth of treatment facilities and operating equipment at the Southwest Treatment Works, as part of the expansion program started 10 years ago to increase the plant's capacity from 400 mgd to 900 mgd. Several smaller contracts will be awarded this year for additional power-generating and sludge-drying equipment. Contracts will be awarded this year for 8 mi of intercepting sewers and control structures for connecting sewers to the new South Side Intercepting Sewer. Contracts for extensions to the Racine Ave pumping station also will be awarded.

COLUMBUS, OHIO — Primary-settling tanks were remodeled at a cost of almost $181,000. Work included removal of two-thirds of the concrete cover, renewal of sludge-collector equipment, and installation of multiple-outlet weir to decrease overflow rate. Grit chambers adjacent to primary units were equipped with air diffusers and transformed into grease-separation channels. New aerated grit chamber costing about $525,000 was put into operation last year. A $200,000 extension to the power house large enough for two engine generators has also been completed.

Work underway is: Installation of a $126,000 1,000-kva dual-fuel engine generator which—when in operation—will make sewage plant independent in power requirements; and construction of eight sludge-digestion tanks to cost about $1,200,000. Tanks are prestressed concrete with 85-ft. diameters and 28 ft side-water depths; two are gasholder type and six have plain floating covers. A plant-liquor disposal unit, a grease-recovery tank, another 100-ton sludge incinerator with housing and two primary settling tanks are now being designed.

INDIANA—Pollution abatement is going ahead rapidly: A total of 31 industrial, 8 municipal and 6 semi-public projects were either completed or under construction in 1949. Sixteen industries have completed new or added facilities to existing plants. Six companies have installed oil separators. Canning industries have built 16 waste lagoons with about 31,000,000 cu ft storage; 16 canneries have improved existing treatment facilities. Other waste-prevention methods ranging from closed systems to incineration are being utilized. An outstanding achievement in pollution abatement was made by the Pfizer Chemical Co. Terre Haute. This plant converts much of its streptomycin waste into a useful by-product, Vitamin B-12.

Municipal work includes: Completion of activated-sludge plants at Noblesville, Rushville and Jasper and of other-type plants at Rockville, Lebanon and Whiting. Work is underway at South Bend—an $881,000 interceptor system and at Richmond—a $870,000 addition to the treatment plant to double its capacity.

Even greater advances in the State's pollution-abatement program are anticipated this year. Indicative of this is the fact that bonds for five municipal plants totaling $1,333,900 have been sold since Jan. 1.

MADISON, WIS. — The Nine Springs sewage plant costing about $900,000 will be completed this spring. Included are: Grit chamber, a primary settling, two aeration tanks, a final settling unit and control building. Also approaching completion is the East intercepting sewer. It consists of about seven miles of 30-36-42 in. reinforced-concrete pipe, two pumping stations.

OHIO RIVER COMMISSION — When Illinois, Indiana, Kentucky, New York, Ohio, Pennsylvania, West Virginia and Virginia, ratified a pollution-abatement compact in June 1948, a stream cleanup program—greater in magnitude than any ever before attempted in this nation—was set in motion. Accomplishments during first year of operation were:

Established standards for the 22-mi stretch of the Ohio known as the Cincinnati Pool. On this information Cincinnati as well as 16 northern Kentucky cities discharging into the pool are proceeding with design of sewage works. Made findings-of-fact in the Pittsburgh as well as the Huntington areas on water-quality requirements in order to expedite construction of remedial works in these badly polluted river sections. Took action in conjunction with two states to prevent the discharge of new pollution in the form of hardness-producing wastes from industrial plants. Secured factual evidence of pollution loads and stream degradation in the Wabash River on which information the States of Indiana and Illinois are strengthening their compulsion for installation of waste treatment plants. Undertook a cooperative program with the Armco Steel Corp., the Wallace & Tiernan Co. and the State of Ohio looking toward development of a method to curb phenols at their source, which wastes are one of the most obnoxious taste-producing substances. Established a special unit to aid in development and acceleration of industrial-waste control measures. Participated in: Promotion of a new pollution law for Ohio; drafting of a new law for Kentucky; and discussions favoring modification of federal tax laws to permit accelerated depreciation of capital expenditures for industrial waste treatment plants. Consulted with federal officials on the establishment of synthetic fuel plants and means to meet problems of adequate water supply and discharge of waste substances from proposed plants. Questions relating to the disposal of radioactive wastes are likewise under discussion. Notified 1,159 municipalities and 1,422 industries of the existence of the eight-state compact, terms of compliance and policies of the Commission.

ROCKFORD, ILL.—All bonds have been issued for the $1,500,000 sewage-improvement program and one-half of the work is under contract. A contract has been awarded for the remaining trunk sewers and additions to the existing treatment plant to permit adequate treatment of 35 mgd of sewage, maximum. Last year $90,000 worth of sewer laterals were completed.

TENNESSEE—Final plans for 15 sewage-treatment plants have been completed; construction starts are anticipated soon. Completed last year were eight industrial treatment or recovery works. One one-third of the industries now discharging wastes into the state's streams are investigating treatment or waste-recovery methods—either independently or in cooperation with municipalities.

ATLANTA, GA.—Financed by $1,250,000 in revenue certificates, a 350-ton per day mixed-refuse incinerator with two rotary kilns is under construction. This unit—which will double the city's refuse-burning capacity—will generate steam to be sold to the local power company for heating.

BOSTON, MASS. — Sedimentation, aeration and digestion tanks, sludge-disposal line and effluent dispersers, building, pump and engine foundations for the $6,500,000 300-mgd Nut Island plant are complete. The main-building superstructure to cost more than $800,000 is being erected. Superstructures for other facilities will probably be built this year. Estimated to be ready for operation in about a year, the overall project is 75% complete. The downstream portion of the $2,000,000 80-mgd Alewife Brook conduit is nearly finished. Work on the $400,000 upstream contract is under way with three 35-mgd and one 10-mgd mixed-flow pumps on order. This section is scheduled for completion at the end of the year.

Expected to be let this year are contracts for the $11,000,000 400-mgd extention of the North Metropolitan relief sewer from Chelsea to Deer Island.

Legislation is proposed to authorize the first stage of the $6,000,000 350-mgd Deer Island treatment plant, the $4,000,000 10-ft tunnel from Charles River dam to Chelsea, the $2,500,000 10.5-ft subaqueous conduit from Boston University to Charles River dam, and the $3,000,000 lower section of the South Charles overflow conduit.

CONNECTICUT—Pollution abatement is being driven forward by the aggressive State Water Commission. Some large sewage-disposal projects in construction under its program, with location, capacity and type of treatment are: Bridgeport, 30 mgd, primary treatment with vacuum filtration and incineration of sludge; Waterbury, 15 mgd, with similar treatment; Fairfield, 4 mgd, activated sludge; New Haven, 6 mgd, first phase of third primary-treatment unit; and East Hartford, 4 mgd, primary treatment. Ansonia, Derby and Shelton are completing plans for a single plant to handle sewage plus industrial wastes. Under state law, the commission is charged with developing methods of industrial-waste treatment. Research looking to development of economical methods for treating brass and copper, textile and dairy wastes is being carried out. To speed up treatment of industrial wastes, the Commission is attacking the problem on a group basis. Some developments are: With a present treatment capacity of 9 mgd, paper and paperboard mills will build 15-mgd additional facilities in 1950 that will eliminate this type of pollution. Brass and copper companies are pursuing studies and working up plans to treat 15 mgd of its wastes. A report on treatment of hat-factory effluents is scheduled for mid 1950 and the remedial program will be pushed in the last half.

AT COLUMBUS, eight prestressed reinforced-concrete tanks—each 85 ft in diameter —will permit sludge digestion and gas collection.

DELAWARE RIVER BASIN — More than $75,000,000 was spent in 1949 on pollution-abatement projects in the Interstate Commission on the Delaware River Basin region. Expenditures for this year are expected to exceed $50,000,000.

Pennsylvania's share in Schuylkill River restoration, now far ahead of schedule, is slated to be complete by mid-1951. To remove more than 30-million tons of coal culm and silt from the river, $35,000,000 is being spent. The work will reclaim about 100 miles of stream bed and bank. An additional $15,000,000 will be spent by the federal government to clean up the Norristown-Fairmount Dam section after June this year when the state's share of the upper-river work will be more than half done. To reduce amount of culm entering the Schuylkill, 47 anthracite-coal operators have built desilting basins. These have cut amount of culm deposited from 2,000,000 tons a year to almost nothing. Total cost of work was about $5,000,000. Under State Sanitary Water Board orders, more than 30 municipalities will build new or improve old waste-treatment facilities in the Schuylkill basin. Contracts totaling $10,000,000 for remedial works are expected to be let in 1950. Also hundreds of industries in the region have been ordered to build treatment plants before 1950 ends. These programs will require expenditures of at least $10,000,000.

Other developments in the Incodel area are: Philadelphia's $60,000,000 sewage program is well ahead of schedule. Three Delaware-County sewer authorities will initiate construction of $5,000,000 worth of treatment works in 1950. Camden, N. J. has authorized a $3,000,000 bond sale (out of a total of $20,000,000) to defray this year's contract costs. Gloucester, N. J. has awarded a $1,250,000 contract for treatment works and Phillipsburg will start work soon. In Delaware, Wilmington, Delaware and New Castle County plan a construction start on a $17,000,000 metropolitan collection and treatment works at the confluence of Brandywine Creek and Christina River. Up-stream cities on Brandywine Creek also are planning plant improvements.

Construction of industrial-waste plants totaling more than $5,000,000 are underway in the Incodel Basin. This rate is expected to continue for several years.

DISTRICT OF COLUMBIA—Expansion of the sewage-treatment plant is 50% complete and well ahead of schedule. The $1,500,000 project includes four each of sedimentation and sludge-digestion tanks. Sedimentation units will increase capacity 33% to 173 mgd while new digestors will add 50% capacity to serve 1,000,000 people.

FLORIDA — Representing $35,000,000, 108 waste-disposal projects have been approved by the State Board of Health in the last three years. Of this number 77 totaling $23,000,000 have been built or are under construction. Some of the largest projects are at Tampa, Orlando, Ft. Lauderdale, Lakeland, Ocala and Tallahassee. Also completed are 23 small industrial-wastes plants and 35 septic tanks or sand filters for schools, night clubs and tourist parks. Waste disposal studies are being conducted for the phosphate, pulp-and-paper-mill and citrus industries.

MIAMI, FLA.—Private interests will build and operate a 900-ton-per-day refusal-destruction plant, based on the Verdier process of disposal by fermentation. The plant—first of its kind in this country—will start operating in Sept. 1951. The city will collect its refuse, but all disposal services will be furnished by the private company for an annual fee of $390,000. At the end of 30 years, Miami gets full title to the plant.

NEW YORK CITY—An agreement with the Interstate Sanitation Commission calls for a $106,000,000 expenditure for sewage-disposal construction in five years. This includes $16,700,000 already committed to work in progress. Projects under construction with type of treatment, percent complete and total cost are: 26th Ward — 60-mgd activated sludge, 87%, $9,256,000; Hunts Point—120-mgd AS and interceptor with pumping station, one, $16,660,000; Owls-Head—160-mgd high-rate AS, 20%, $23,400,000; East Bronx: Interceptor—collecting sewer, 100%, $1,355,000; Whitestone interceptor—Collecting sewer, 90%, $1,946,000; and Lower Manhattan interceptor—Collecting sewer, 56%, $825,000. Improvements to existing plants are proposed that will cost about $1,500,-

000 of which contracts for about $500,000 will be let in 1950. Sewage-treatment plants to be completed before 1954 with type of treatment, present status and total cost are: Rockaway—15-mgd high-rate AS and interceptors, designed, $6,650,000 (to be let in 1950); Point Richmond—10-mgd sedimentation and interceptors, in design, $2,000,000 (also to be let in 1950); Oakwood Beach—15-mgd high-rate AS and interceptors, in design, $7,300,000; and Bowery Bay extension—80-mgd AS and interceptors, in design, $23,123,000. No raw sewage will be discharged into waters used for bathing after 1953 when six new plants, existing-plant expansions and interceptors are in operation. Complete cleansing of remaining waters around New York City will be accomplished by a supplementary sewage-disposal program to be complete by end of 1958.

NEW YORK STATE—The Water Pollution Control Board has been activated by recent passage of legislation. First steps in carrying out its objectives are being made. These include: Development and adoption of classification system for state waters and comprehensive studies of specific waters to determine essential facts needed for sound classification. Following public hearings, specific waters will be classified and standards of quality will be assigned to them. When these steps have been completed, the Board will have authority to compel treatment of wastes to maintain established standards in receiving waters.

PENNSYLVANIA – The Clean Stream program enters 1950 with a fine record of accomplishment. Orders have been issued to 559 municipalities and institutions to submit plans for pollution abatement. Of these 469 have engaged engineers and 193 submitted plans to the Sanitary Water Board. With 310 existing sewage works, 11 additional plants are under construction and orders for more projects are about to be issued. In southeastern Pennsylvania, 26 municipalities in four joint projects under authorities are under orders to build treatment works. Only 76 municipalities are not included in the stream clean-up program. This is because they discharge acid-mine wastes–for which no feasible treatment method is known–to streams.

Industries as well as cities are stepping up pollution-abatement work. Waste-treatment notices have been sent to 685 industries and 125 others have submitted plans for remedial projects. In addition, collieries are under orders to remove silt from their waste waters. Size of industrial-waste projects range downward in size from one $4,000,000 refinery disposal-plant. Four paper mills are completing works at a total cost of about $3,000,000; one specialty company has installed a $400,000 plant for treating plating wastes. Of 174 active breakers in four anthracite coal fields, 145 have desilting works in operation, 18 are under construction and only 11–under orders–have not started construction. One operator has invested $2,000,000 in waste-treatment works.

PHILADELPHIA, PA. — Contracts totaling $23,880,000 have been let for the $60 million sewage-disposal program, including three plants and intercepting sewers. The 125-mgd activated-sludge Northeast plant—about 90% complete—includes primary-settling, modified-aeration, final-settling, sludge-digestion, power-plant and administrative facilities. Operation is scheduled for Aug. 1950. The $800,000 pumping station for the Southeast plant is about 50% complete. Plans for the 140 mgd SE plant are being prepared in anticipation of contracting letting this year. Processing will include flocculating with air and primary settling; sludge will be pumped to Southwest works. Construction of the 136 mgd. SW plant has been started with a $1,400,000 30% complete contract for general construction and mechanical equipment for settling tanks. Treatment will be preflocculation and primary settling with sludge being digested and disposed of in lagoons. Digestion tanks will be advertised soon.

Interceptor work includes: Lower Delaware Collector—11 ft in dia. and built in tunnel—$2,650,000 first section is complete; $2,100,000 second section in progress; and third section to be let late in 1950. East Central Interceptor—To serve SW plant, one $1,800,000 11-ft dia. section, in-rock-tunnel section is under contract. SW Main Gravity Interceptor—A $750,000 open-cut and a $7,000,000 3-mi in-rock-tunnel section will be let early in 1950. Contracts let for other new sewers in 1949 totaled $3,115,000.

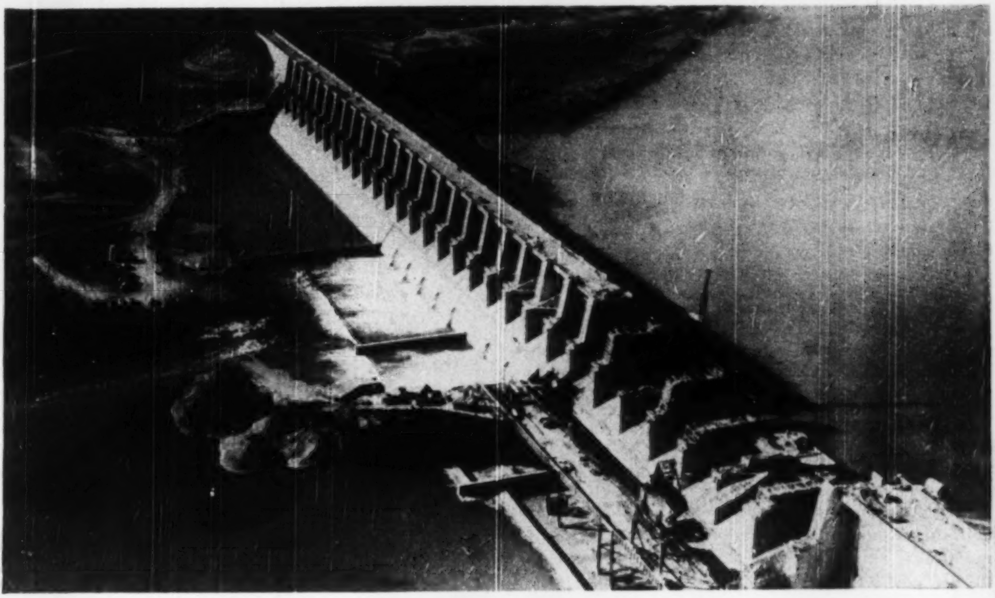
PITTSBURGH, PA.—The Allegheny County Sanitary Authority has been authorized by a two-year contract with the City of Pittsburgh to prepare detailed plans and specifications for a sewage-disposal project to serve the City and adjacent municipalities. Adjacent cities are to be accepted into the general scheme only when rates to be charged cover not only costs of the extra-volume treatment but also of service extensions to them. Called "Project Z", this plan came as a result of the failure of smaller communities to act on the long-term contract submitted by the authority. This project now incorporates the City of Pittsburgh as well as 57 nearby cities. It will cost about $60,000,000 and be financed from revenue bonds supported by sewer-service charges. Charges will be collected from users on basis of water usage. Participating contracts are tri-partite; they must be executed by Pittsburgh's officials and the authority. Under the design contract $2,000,000 has been made available by the City for administrative and plan-preparation costs. Project plans must be submitted to the State Sanitary Water Board on Dec. 31, 1951.

The forty-odd municipalities outside of Project Z must either construct their own treatment facilities or bear the extra costs of interceptor extensions to the proposed plants.

Surveys, studies and design of a pilot plant pointing to a final determination of the method of treatment for Project Z are in progress. Earlier investigations have lead to the decision that most industrial wastes will be accepted for disposal in the proposed system. Some wastes will require pre-treatment but pickle liquor from steel plants will not be accepted in unlimited quantities.

POTOMAC RIVER BASIN—Municipalities as well as industries are cooperating fully with the Interstate Commission on the Potomac River Basin educational program to abate stream pollution. Frederick and Hagerstown, Md. and Winchester, Va. have completed sewage-treatment projects. The District of Columbia plant is being enlarged at a cost of $1,500,000. Remedial works are being built by food processing, pulp-and-paper, tannery, viscose-rayon, and textile-wool dyeing, weaving and finishing companies. Also represented are chemical plants, slaughter houses and railway yards. These accomplishments have been carried out under the Commission's mandate to coordinate, tabulate and summarize data on pollution, character and condition of streams in its jurisdiction, promote uniform pollution legislation, study treatment methods and recommend standards of stream cleanliness to the states in the Potomac Basin.

WINCHESTER, VA.—A 24-mgd high-rate trickling filter plant with primary and secondary sludge digestion has been completed at a cost of $650,000. More than five miles of sanitary sewers have been built at a cost exceeding $200,000.



FORT GIBSON DAM on the Grand River, in Oklahoma is now 95 percent completed. It is an Army Engineer project.

River Development

RIVER WORK—levees, dams and hydro plant construction—reached an all-time high in 1949. Like 1948, the total contracts let exceeded a half-billion dollars, and this high level of activity is expected to continue throughout 1950. Both the Corps of Engineers and the Bureau of Reclamation programs of construction are of unprecedented size. No single definite policy guides the nation in these great river basin undertakings, however, and 1949 witnessed a realization that one must be formulated that is consistent with our national ideals and needs.

Water Policy Review

TWO YEAR-END developments seem to point to better coordination and more purposeful federal planning for water use and control. The first was appointment by President Truman of a temporary Water Resources Policy Commission, and the second was an announcement by the Engineers Joint Council that it will name groups of engineers to assist in formulating a better national water policy. Acceptance of the recommendations of these EJC groups by the Presidential commission will go far toward providing the broad base and perspective that formulation of a sound national water policy demands.

That there is widespread disagreement as to what federal policy should be is evident in the current campaign in California for the Democratic nomination for senator from that state. The fight between the present incumbent, Senator Sheridan Downey, and Representative Helen Gahagen Douglas is based almost entirely on federal water policy. Senator Downey has been bitterly critical of the Bureau of Reclamation's top management, its administration of the Central Valley project in California, and of the 160-acre limitation on land holdings that receive water from federal irrigation projects. Mrs. Douglas gives unqualified endorsement to policies of the present administration. Thus a full-scale voter test of thinking on federal policy in one large state is in the making.

No New Projects

THE FACT that no important federal irrigation or river control projects were authorized in 1949 and that none is included in present planning makes this a particularly desirable time to make a study of federal water development policy. This lull in the start of new work was, however, not brought about deliberately. It is simply the outcome of the great upswing in irrigation, power, navigation and flood-control work that followed the war, which put under way many projects requiring several years for their completion, generally with increasing apropriations as the work advanced. As a result, these federally financed projects today represent the greatest construction budget in federal history.

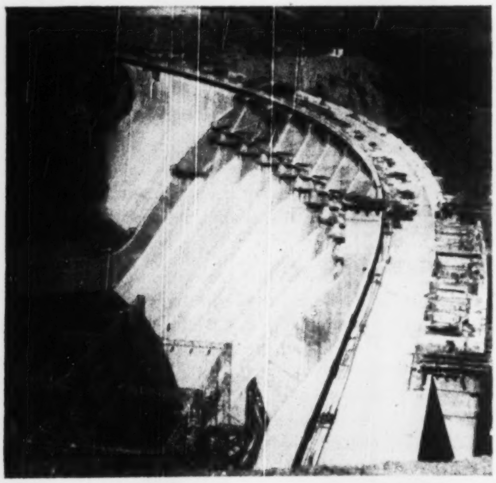
Many of these projects are now approaching the stage where they will begin to show tangible results. Thus the Columbia Basin irrigation project is expected to deliver water to 87,000 acres in 1952 and to about 60,000 acres a year thereafter. Ultimately it will supply water for 1,000,000 acres of land.

The first large-scale Central Valley project water is to be available in 1951. Davis Dam power is to be on the line in 1951, Hungry Horse in 1952 and McNary in 1953. In each case the first water or power delivered will be a relatively small amount compared to the full project development in the following years.

Large Quantities of Power

A VAST AMOUNT of power is to be produced in the Pacific states as part of this program, yet the rate of addition of new power units hardly keeps pace with increasing demand. In addition to the three plants mentioned above, the last three units in the Grand Coulee power plant will go into service in 1951, bringing the total installed capacity there up to 1,316,000 kw. Similarly, all the remaining units at Hoover Dam will be on the line in 1951 or 1952, bringing that plant up to 1,322,000 kw.

Because the Hoover Dam plant will soon be up to capacity, proposals are being made for construction of another big power dam on the Colorado at the Bridge Canyon site. But that dam is so closely tied to controversy between California and Arizona over distribution of the waters of the lower Colorado basin as to make it appear improbable that work on it will start until after that controversy is settled.



ALLATOONA DAM on the Etowah River in Georgia is 93 percent completed. Power production has already started.

Water Conflicts and Compacts

NO REAL PROGRESS is being made toward solution of the California-Arizona dispute over the waters of the Colorado allocated to the states of the lower basin under the Colorado River Compact. Bills were introduced in Congress during the year that would have made it possible for the U. S. Supreme Court to make a determination of the amounts to be used by each state, but none of the bills was passed because of disagreement over the provisions of each bill.

Meanwhile the compact between the five states of the upper basin for apportionment of the water allocated to them, which was signed late in 1948, was approved by President Truman, thus putting that agreement into effect.

Flood Control Moves Ahead

FLOOD CONTROL operations across the country made no spectacular gains, but the volume of construction under way remains at record levels. At the end of the year, 73% of the work called for under the Pick-Sloan plan for the Missouri River was under contract. Similarly, progress on such river systems as the Arkansas, the White, Susquehanna and the upper tributaries of the Ohio has advanced to the point where material reductions should be made in future floods on those streams.

Levee and flood-wall work also advanced well at many points throughout the country where no amount of upstream storage can provide protection for low-lying areas.

Water Project Jurisdiction

THE BUREAU OF RECLAMATION in 1949 won a major victory in its long-time battle with the Corps of Engineers over project jurisdiction. In spelling out the responsibilities of the two agencies for Folsom Dam on California's American River, Congress directed that "upon completion of construction by the Corps of Engineers. . . . (the dam) shall be transferred to the Bureau of Reclamation for operation and maintenance." The bureau will also build all the power facilities and canals. The Army had proposed a 355,000-acre-ft reservoir for flood control. The bureau was successful in getting this increased to 1,000,000 acre-ft to include power, irrigation and other benefits.

The "Folsom formula" followed earlier recommendations by President Truman that the scope of Army work on multiple-purpose projects that it already had under way be restricted. The President further recommended (with no acceptance by Congress as yet) that Army water development work in the West be limited in the future to projects involving flood control or navigation with no other multiple-purpose aspects.

THE BUREAU OF RECLAMATION'S DAVIS DAM, on the Colorado River, will be finished this year, forming Lake Mojave.

Hoover Commission Report

WHETHER THESE DEVELOPMENTS portend Presidential acceptance of the conclusions relating to river basin development of the Hoover Commission report on governmental reorganization is not yet clear. This report, a major event of 1949, included the recommendations of two special task committees, one on natural resources and the other on public works. Although differing in numerous particulars these recommendations could readily be correlated into a policy that would remove civil works construction from the jurisdiction of the Corps of Engineers to the Department of the Interior. Congress showed no disposition to touch off the hot fight that is certain to ensue when and if such a major change is embodied in a bill to be acted upon.

In setting up his temporary water policy commission, the President specifically instructed it to keep away from this controversial administrative question. The implication, supported by some off-the-record but authoritative statements, is that the President is reserving this particular matter for his own decision, but with the hope that he can establish his own policy by executive order and without the necessity of congressional debate.

St. Lawrence Development

NO PROGRESS was made during the past year toward development of the international section of the St. Lawrence River for power and navigation. If anything, the project was set back by a recommendation of an examiner of the Federal Power Commission to the commission itself that it deny the application of Power Authority of the State of New York for permission to proceed with development of power in the river jointly with the Hydro-Electric Power Commission of Ontario.

However, President Truman has reiterated his wish that Congress would take such action as is necessary to get the work started. In his most recent statement on the matter he tied the St. Lawrence project in with the ill-fated Passamaquoddy tidal power project as among the possible sources of more power for New England. In March of last year President Truman gave his aproval to a plan for the U. S. government to contribute $30,000 toward the cost of a restudy of the entire Passamaquoddy scheme by the International Joint Commission. That study is under way, and the engineering board having it in hand expects to report to the commission in April.

Dam-Building Techniques

INTEREST in better methods for earth-dam construction continues to be high, due doubtless to the fact that so many of the large dams under construction or projected are of this type. The Corps of Engineers has the subject of compaction equipment under active study. Present thinking is that pneumatic rollers have a distinct advantage over the sheepsfoot roller. Equipment manufacturers are cooperating by building test equipment to specifications developed in the study.

Meanwhile new types of soil sampling and testing devices have been developed in some of the research laboratories. One small device designed at Harvard cuts the test time and appears to give better correlation between laboratory and field compaction results than could be obtained with older equipment. New knowledge of the interrelation of laboratory testing and field checks has been gained as a result of research in still other laboratories.

In the field of concrete dams, improvements not only in construction techniques, but in the material itself are being actively sought. Even design assumptions are being subjected to more critical analysis than ever before. The latter results from the growing realization that concrete is not an elastic but a plastic material that "flows" to make salutary stress readjustments in a loaded mass such as a dam.

Nearly every change in dam concreting procedures is predicated on a desire to reduce volume change and the resultant cracking. Additions of air entraining agents or pozzolanic materials are of this pattern. Davis Dam concrete was made with calcined shale replacing 20% of the cement, while in Hungry Horse Dam a 33% replacement using fly ash has been adopted. Handling these separate materials on the job adds a new construction problem, but until suitable portland-pozzolan cements are generally available more and more jobs will encounter it.

Manufactured aggregates, necessary where good natural aggregates are lacking or where the size grading is poor, are becoming more common, requiring the installation of large and costly crushing and screening plants. The necessity for controlling the temperature rise of freshly placed concrete, often accomplished by embedding a grid of coolant pipes in the dam, has also led to precooling the concrete by substituting ice for some of the mixing water. Ice making machines were a part of the construction plant on several dams under way during 1949.

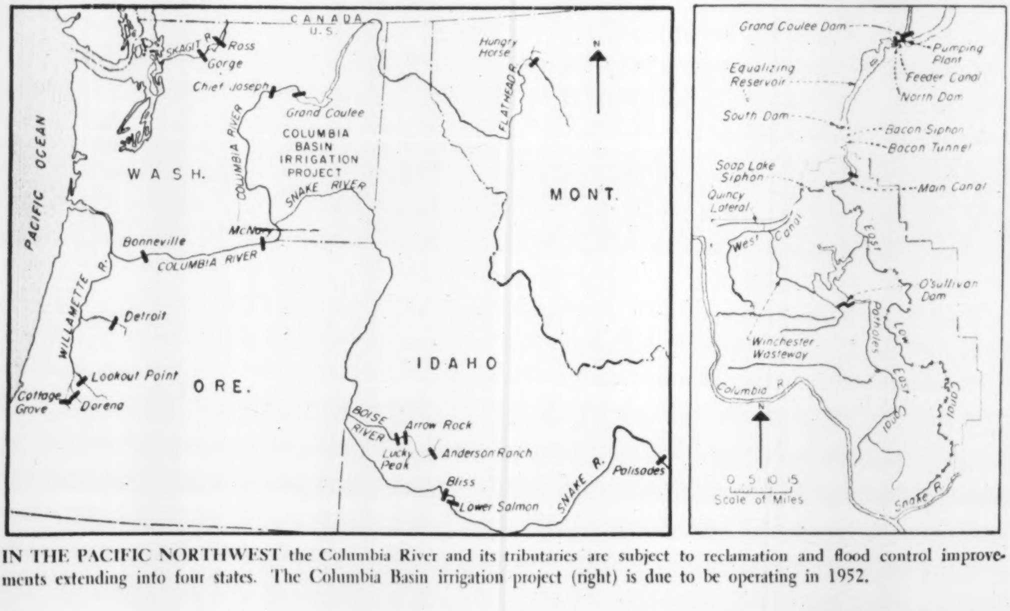
Some Major River Development Projects

COLUMBIA RIVER BASIN—Construction work on the Bureau of Reclamation's **Columbia Basin** irrigation project, designed to supply irrigation water to 1,000,000 acres in eastern Washington, is reaching a crescendo, with the first 87,000 acres to be irrigated in 1952. Two of the ultimate installation of twelve 1,350-cfs pumps at the **Grand Coulee pumping plant** (the world's largest) will be initially operated in 1951 to fill the system's equalizing reservoir formed in the Grand Coulee by the **North Dam** and **South Dam.**

At the beginning of this year power features of the project were 72% complete and irrigation features 18%. After 1952 some 60,000 acres will be placed under irrigation each year. A total of $120 million worth of contracts are now in force. Major contracts awarded in 1949 are channel improvements at **Coulee Dam**—$1,600,000; **North Dam** and feeder canal—$4,700,000; **Potholes** east canal—$937,000; second section, **east low canal**—$8,029,000; second section, **west canal**—$2,800,000; third section, **west canal**—$1,300,000; and **Winchester wasteway**—$1,088,000. Previously granted contracts still active at the beginning of 1950 were for six generators for east powerhouse—$10,578,000; six turbines for east powerhouse—$5,000,000; spillway-bucket repair—$1,800,000; pumping plant pumps and motors—$4,000,000; **Bacon siphon** and tunnel—$3,400,000; **Soap Lake siphon**—$7,600,000; and **Grand Coulee Dam** pumping plant—13,300,000. Major contracts completed in 1949 include **South Dam**—$3,100,000; lining of **main canal**—$1,500,000; first section, **east low canal**—$4,000,000; first section, **west canal**—$2,800,000; and **O'Sullivan Dam**—$10,500,000.

Three 108,000-kw units were installed in the east powerhouse at **Grand Coulee Dam;** three more will be completed in 1951; and the final three will be installed sometime during 1951.

Real help for the power shortage from federally built facilities will come late in 1952 when the first of four 71,250-kw units goes on the line at **Hungry Horse Dam.** On this job some 60,000 cu yd of concrete was placed in 1949 and about 1,000,000 cu yd is scheduled each year for the next three years. Located on the South Fork of the Flathead River (a Columbia River tributary) in northwestern Montana, **Hungry Horse Dam** involves the Bureau of Reclamation's largest single postwar contract ($43,000,000) and it will be the fourth largest and third highest (564 ft) concrete dam


CANADA
U.S.
SKAGIT R.
Ross
Gorge
Chief Joseph
Grand Coulee
COLUMBIA BASIN IRRIGATION PROJECT
COLUMBIA RIVER
SNAKE RIVER
WASH.
PACIFIC OCEAN
McNary
Bonneville
COLUMBIA RIVER
WILLAMETTE R.
Detroit
Lookout Point
Cottage Grove
Dorena
ORE.
Hungry Horse
FLATHEAD R.
N
MONT.
IDAHO
BOISE RIVER
Arrow Rock
Lucky Peak
Anderson Ranch
Bliss
Lower Salmon
SNAKE R.
Palisades
Grand Coulee Dam
Pumping Plant
Equalizing Reservoir
Feeder Canal
North Dam
South Dam
Bacon Siphon
Bacon Tunnel
Soap Lake Siphon
Main Canal
Quincy Lateral
West Canal
East
O'Sullivan Dam
Potholes
Low
Winchester Wasteway
Columbia R.
East Canal
Canal
Snake R.
0 5 10 15
Scale of Miles

IN THE PACIFIC NORTHWEST the Columbia River and its tributaries are subject to reclamation and flood control improvements extending into four states. The Columbia Basin irrigation project (right) is due to be operating in 1952.

in the world. The reservoir area is being cleared.

Other Bureau of Reclamation work in the Pacific Northwest area includes the following: **Anderson Ranch Dam** is nearly complete. During 1950 the spillway will be finished and the first of three 13,500-kw generators will be installed. **Palisades Dam** is in the preconstruction stage, waiting for certain water-saving agreements to be worked out. The **Roza Division** of the **Yakima** project will involve in 1950 completion of the pumping system. Lateral construction in the pumping area will permit the addition of 24,900 acres of newly irrigated land this year—45,000 acres are already served by gravity irrigation.

The greatest new power installations under construction in the Pacific Northwest are **McNary Dam** and **Chief Joseph Dam**, both on the Columbia River and both Army Engineer jobs. First McNary unit is to go on the line in 1953 and other units will follow later at both dams.

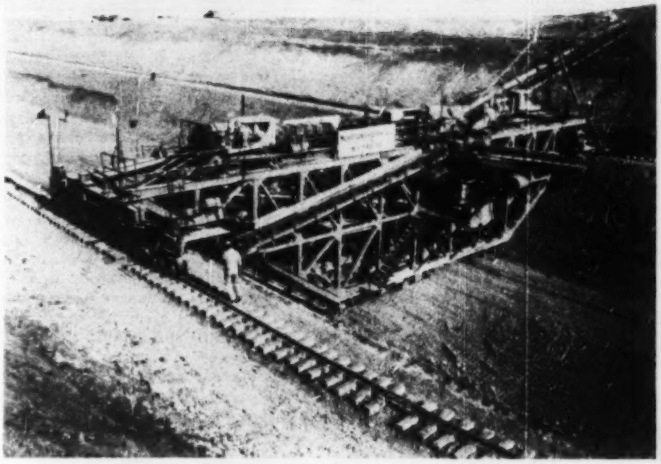
Two main contracts have been awarded on **McNary Dam** work: one was let in 1949 for the Oregon shore cofferdam (including excavation for a portion of the powerhouse, concrete superstructure for two main power units and a second step cofferdam); the other was let in 1948 for Washington shore installations (including the navigation lock, 13½ bays of spillway, fish ladder and lock, and a portion of the Washington shore abutment). The Oregon shore $15,835,000 contract is in initial stages of construction, while the $21,733,000 Washington shore installations are 70% completed.

Preliminary construction on **Chief Joseph Dam** began in 1949. Contracts scheduled for 1950 include construction of a bridge across the Columbia River, and buildings and utilities for government personnel. The project, estimated to cost $206 million, will be the second largest power plant in the world, exceeded only by Grand Coulee. The 27 generating units drawing water from the new dam will have a total rating of 1,728,000 kw.

Work on the Willamette Basin flood control, power, navigation and irrigation project in western Oregon proceeded ahead of schedule. **Dorena Dam** on Row River was completed and two other major dams are under construction: **Detroit Dam** on the North Santiam River and **Lookout Point Dam** on the Middle Fork of the Willamette.

On the **Detroit** project a $28,000,000 contract was awarded early in 1949. So far the contractor has built aggregate-producing facilities and a construction camp.

Railroad and highway relocation contracts were awarded at **Lookout Point Dam**, and the main contract for this $30,000,000 project will be let this spring.



MASSIVE RIG spans 110 ft between rails to bring Delta-Mendota Canal to grade on the Central Valley Project in California. There are 39 miles finished, 79 to go.

A contract was awarded for the first major construction work on the $22,000,000 **Lucky Peak Dam** flood control project on the Boise River, near Boise, Idaho.

Major hydroelectric work on the Skagit River will add to power supply. Third step on the $28,000,000 **Ross Dam**, fourth highest in the world, was completed in 1949 for Seattle City Light, and work began on a $10,000,000 project to increase the capacity of the downstream **Gorge** powerhouse. Bids will be called in 1950 for construction of the $30,000,000 **Ross** powerhouse (cost includes equipment). Two 27½-ft tunnels must be extended through granite 630 ft to the 90x370-ft powerhouse, scheduled to go into production late in 1952.

Meanwhile, the largest private power development in the Pacific Northwest is under way by the Idaho Power Co., which increased its power supply from 132,000 kw to 240,000 kw during 1949. Included are **Lower Salmon Dam** (65,000 kw) and **Bliss Dam** (25,000 kw), both on the Snake River. Company postwar investment in hydro facilities will total $50,000,000.

POWER FOR CALIFORNIA—Two new Pacific Gas and Electric Co. hydroelectric plants went on the line late in 1949 and early in 1950. Both are located on the **Feather River**; each has a concrete diversion dam and a tunnel to its penstocks. The $26,500,000 **Cresta** plant is rated at 75,000 kw, and the $35,000,000 **Rock Creek** plant at 125,000 kw. Work is scheduled to start this year on **Bear River Dam** on the Mokelumne River to add storage for downstream plants. On the Kings River preliminary work will start in 1950 with full speed in 1951 on a $60,000,000 development—provided the Federal Power Commission doesn't rescind a license granted PG and E late last year.

In the south, Southern California Edison spent $66,000,000 in 1949 and budgeted $51,500,000 for 1950. Major hydro work underway includes an 84,000-kw unit being built on the upper reaches of the **San Joaquin River**.

The city-owned Los Angeles Department of Water and Power has underway a $42,000,000 project in the **Owens River Gorge** on the eastern slope of the Sierra Nevada. Tunnel drilling is 65% complete with lining to start as soon as a tunnel is holed through. The project involves three 37,500-kw plants.

CENTRAL VALLEY PROJECT—Bureau of Reclamation construction in 1949 concentrated on the **Friant-Kern Canal**, the **Delta-Mendota Canal** and the **Tracy Pumping Plant**. Part of the **Friant-Kern Canal** is now in operation for delivery of surplus water; 75 miles are completed, 58 miles are under construction and contracts for the remaining 23 miles will be let in 1950. The first 39 miles of the **Delta-Mendota Canal** are complete, and the remaining 79 miles are under way with the contract for the last 18 miles awarded early in 1950. The 4,600-cfs

Tracy Pumping Plant is 50% complete. The pumping plant feeds into the **Delta-Mendota Canal**, and both are scheduled for initial operation in 1951. At that time major diversions can be made through the **Friant-Kern Canal.** Work is also under way on **Keswick Dam, Tracy Switchyard, Delta Cross-Channel**, irrigation distribution systems and transmission lines for the system.

The Corps of Engineers advanced construction of Central Valley Project units that have major emphasis on flood control in 1949 by awarding a $23,000,000 contract for **Pine Flat Dam**, a 440-ft high, concrete-gravity structure on the Kings River. **Folsom Dam** on the American River is in the design stage with the decision reached in 1949 to make the main structure concrete-gravity rather than earthfill. **Folsom** and **Pine Flat** will both have 1,000,000-acre-ft reservoirs. **Isabella Dam** on the Kern River is still in the preliminary construction stage.

SOUTHERN CALIFORNIA–Corps of Engineers flood control work in Los Angeles County continues at a rate of more than $10,000,000 a year. Major emphasis is on **Los Angeles River** channel improvements. First construction on the $50,000,000 **Whittier Narrows** project will start in 1950 with awarding of a contract estimated at more than $2,000,000 for spillway and east end embankment. At San Diego $2,200,000 is available to finish the north jetty, levees and flood channel of the **Mission Bay** development, a combination flood control, navigation and recreation project sponsored by the Corps of Engineers and the city of San Diego.

SACRAMENTO SHIP CANAL–Some $1,500,000 in contracts for levee moving and channel dredging will be awarded early in 1950 to start actual construction on the **Sacramento Ship Canal**, a Corps of Engineers project. The project centers on a 43-mi canal with a 30-ft depth that will permit ocean-going ships to dock near Sacramento, Calif.

PROVO RIVER, UTAH–A $4,400,000, contract for completion of the 6-mile **Duchesne Tunnel** was awarded last fall. The tunnel is the last major unit in a project that will supply domestic and irrigation water in the area between Salt Lake City and Provo, Utah. To be completed this summer are 5.5 miles of difficult pipeline construction on the 41-mi **Salt Lake Aqueduct**; 31.5 miles were completed by December, 1949. A 40-mg covered concrete reservoir at Salt Lake City will be started this summer.

COLORADO RIVER BASIN – **Granby Dam** and **Granby Pumping Plant** on the **Colorado-Big Thompson project** (Bureau of Reclamation) are virtually complete with pumps now being installed. The **Granby Canal** is finished. On the eastern slope, **Horsetooth Reservoir** (involving four dams) and **Olympus Dam** are complete. **Poudre Canal**, an irrigation feature, will be started in 1950. **Pole Hill Tunnel** and **Olympus Tunnel** are well under way. **Estes** and **Mary's Lake Power Plants** will be finished this summer. The power transmission line through **Adams Tunnel** is under way. This 69-kv line is encased in a 5-in. dia., hydrogen-filled, hermetically sealed pipe.

At **Hoover Dam**, contracts for all remaining generators have been let with new power to go on the line in 1951 and 1952.

Formation of Lake Mojave behind **Davis Dam** started early in 1950 with the placing of concrete stop-logs in slots left in the spillway openings. When filled, the lake will extend the entire 67 miles to **Hoover Dam.** The construction contract for **Davis Dam** will be completed this year. First power will be generated in 1951.

On the 18.5-mi **Welton-Mohawk Canal** of the **Gila Project** in Arizona, two canal contracts and one contract for three pump plants are underway. Contracts for other features are being awarded for the project to serve 75,000 acres.

The underground lateral system for the **Coachella branch** of the **All-American Canal** is 75% complete. This system will serve 78,000 acres just north of California's rich Imperial Valley.

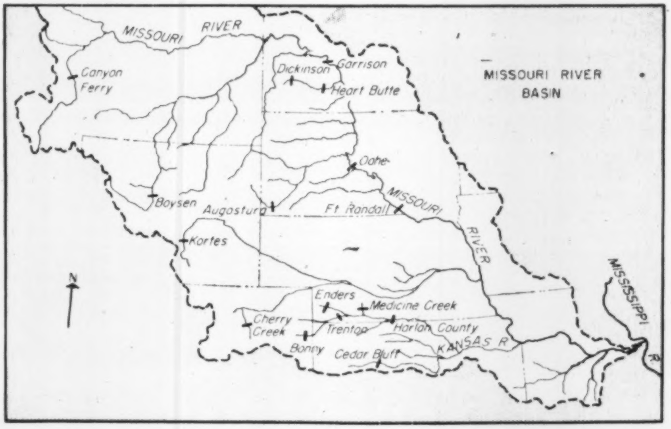
Morelos Dam, being built on the boundary section of the Colorado River by the Mexican government is 80% complete. This structure, authorized by the 1944 treaty, will divert water for irrigation of Mexican lands. It will be completed this spring.

MISSOURI RIVER BASIN–At the start of this year the Corps of Engineers had under construction 73% of its authorized projects for the Missouri River under the Pick-Sloan Plan. Contracts in force totaled $161 million.

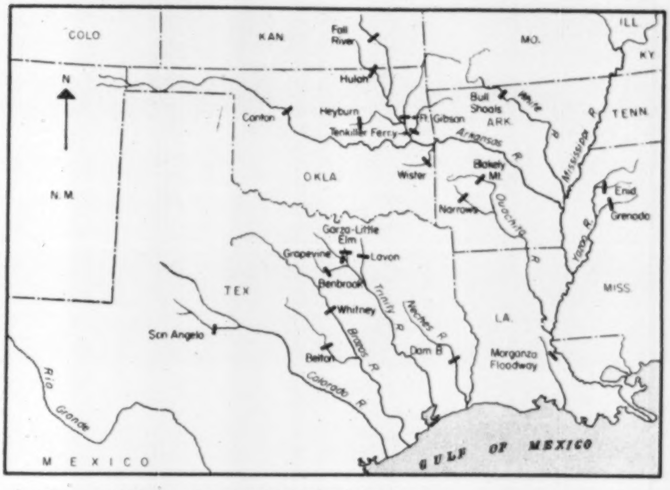
Garrison Dam is 26% finished in North Dakota and will be the world's largest rolled-fill dam upon completon in four years. Its 70,000,000 cu yd will extend 12,000 ft across the valley with a maximum height of 210 ft. Initial power capacity is to be 240,000 kw. Total cost is estimated at $202 million. Contracts for stilling basin and powerhouse foundations are to be let this spring; this year's 7-month construction season should see completion of the second stage embankment.

In South Dakota, **Fort Randall Dam** is 22% finished with completion expected four years hence; its total cost, $165.9 million. Contracts so far have been for intake works, tunnels and early stages of earthwork. Upstream near Pierre construction is getting under way on the $234 million **Oahe project.** Stage 1 earthwork and additional housing for construction forces are planned for 1950. It will be earth fill, 242 ft high and 9,300 ft long.

Harlan County Dam on the Republican River in Nebraska is being built at a cost of $49,000,000. This 11,828-ft. long structure will have a concrete section 1,350 ft long and



THE PICK-SLOAN PLAN for the Missouri River Basin is becoming reality as Army Engineer and USBR projects progress.



CORPS OF ENGINEERS FLOOD CONTROL JOBS are numerous on east Texas rivers as well as in basins tributary to the Lower Mississippi.

106 ft high. It is 55% finished. **Cherry Creek Dam** just southeast of Denver, Colo., was substantially completed for flood control last year at a cost of $15,700,000.

Nearly $40,000,000 are to be spent on so-called **agricultural levees** along the Missouri from Sioux City, Iowa, to its mouth. Dollarwise, this work is near 15% finished. Over 1,000 miles of levees are contemplated. The **Omaha levee project** is 75% complete with 12.5 miles of levee and 5,700 ft of concrete floodwall finished. Revetment work will continue this year on the $6,760,000 project. And the **Kansas Citys** flood protection job is half done with its total cost estimated of $41,389,000. Protection of 26 sq mi of industrial area is to be accomplished by the project.

As its share of water use and control works on the Missouri the Bureau of Reclamation wound up some jobs last year and started others. Work started at **Canyon Ferry Dam** on the Missouri near Helena, Mont. This is to be a concrete gravity structure 212 ft high. **Heart Butte Dam** was finished on Heart River, N. D. And **Boysen Dam** and power plant are some 65% finished on Big Horn River, Wyo. The 15,000 kva power installation at this earth dam is to be completed in 1952. On the Cheyenne River in South Dakota **Angostura Dam** is substantially finished. A 135-ft high concrete structure flanked by earth dams, it will irrigate 16,000 acres. And on Grand River in the same state **Shadehill Dam**, an earth embankment, was begun last year.

Trenton Dam on the Republican River near Trenton, Neb., is started with 50% of its 1,800,000-cu yd foundation finished. The earthfill dam proper is to be 5,600,000 cu yd and 100 ft high. Foundation work will be completed and the main contract started late this year; total cost is $24,800,000. **Bonny Dam**, also on the Republican but near Hale, Colo., is a $16,500,000 earth and rock fill, 8,000 ft long and 46% done. Outlet works and major portion of embankment are to be completed this year. On Smoky Hill River, in Kansas $17,700,000 **Cedar Bluff Dam**, an earth and rock fill structure 11,000 ft long, is 36% complete. **Kortes Dam** and power plant on the North Platte River near Casper, Wyo., is a 36,000 kw installation 78% complete. Units will be installed and the concrete dam finished this year; total cost; $11,600,000.

Medicine Creek Dam, a 3,600,000-cu yd earth and rock fill structure in Nebraska that cost $7,500,000, was finished last year in 47% of the contract time. And on Frenchman Creek in Nebraska, **Enders Dam** is all but finished. It is a 100-ft high earth fill that cost $7,700,000.

TEXAS RIVERS—Eight flood control dams worth $172 million are under construction by the Corps of Engineers in Texas. **Dam B** is underway on the Neches River as a navigation aid as well as flood control structure; it will cost $6,500,000 ($2,000,000 by local interests) and be finished in 1951.

On Trinity River tributaries above Dallas—**Grapevine, Garza-Little Elm** and **Lavon** dams are respectively 18, 4 and 16% completed. **Grapevine** will cost $16,564,000 of which $2,174,000 will come from local sources; **Garza-Little Elm**, largest of the three, will be 33,055 ft long, store 1,016,200 acre-ft and cost $26,644,900 ($3,323,000 of local money). **Lavon** will cost $16,380,000. Upstream of Ft. Worth the $14,000,000 **Benbrook Dam** is 43% finished.

On the Brazos River above Waco, multipurpose **Whitney Dam** is 39% complete; final cost, $42,000,000. It will have a maximum height of 167 ft and produce 85,000,000 kwh yearly. And in the same watershed on the Leon River work started last July on $22,500,000 **Belton Dam.**

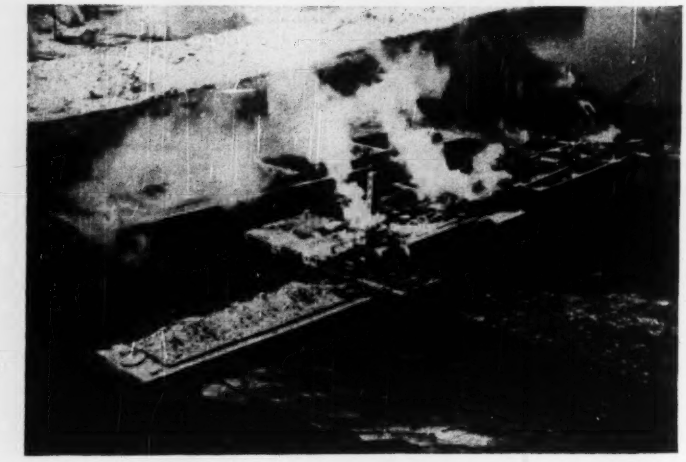
Farther west, on the North Concho River, $18,525,000 **San Angelo Dam** is 30% completed.

RIO GRANDE—The International Boundary and Water Commission started preliminary work on **Falcon Dam** last December by letting a site-clearing contract. Awards for construction of buildings and facilities have since been made, and major construction contracts are expected to be let in April. Construction cost is $46,065,000 exclusive of items to be paid for separately by the governments: land, construction camps, highway relocation, administration and engineering costs.

Located 75 miles downstream from Laredo, Tex., the rolled earth dam is to be 26,294 ft long and have a 150-ft maximum height. A reservoir of 4,085,000 acre-ft will be stored for power, flood control and irrigation upon completion, slated for November 1953. Identical power plants—one either side of the international boundary—will have three units, each capable of developing 14,750 hp at a rated head of 100 ft.

ARKANSAS RIVER BASIN—Army Engineers had $12,000,000 to spend in fiscal 1950 on **Fort Gibson Dam.** The concrete gravity and rolled earth structure is now 95% complete, and the entire project will be finished in 1953 on the Grand River just above its confluence with the Arkansas. The 2,850-ft long dam is to be 110 ft high.

Work on $23,000,000 **Tenkiller Ferry Dam**, flood control and power project, is now 25% completed on another Arkansas River tributary, the Illinois in northeastern Oklahoma. This rolled earth embankment is to be 190 ft high and 3,000 ft long. For flood control of the Caney River just south of the Kansas-Oklahoma line, **Hulah Dam** is to be 5,200 ft long and 97 ft high. Present contracts are 68%



DREDGING below St. Anthony Falls on the Mississippi at Minneapolis is one step toward development of an upper harbor above the falls.

completed on the rolled earth structure, which is to have a concrete spillway. On Polecat Creek, near Sapulpa, Okla., **Heyburn Dam** is 77% complete. Its rolled earth embankment will be 2,920 ft long and 67 ft high.

Total cost of these four dams under construction in the basin is estimated at $85,000,000. During 1949 three others—**Wister, Fall River** and **Canton** reservoirs—were finished.

WHITE RIVER BASIN—Arkansas' biggest dam—$76,000,000 **Bull Shoals** on the White River near the Missouri line—was just over 50% finished at year's end. Completion is set for 1952 when the flood control storage will be 2,360,000 acre-ft and initial power capacity will be $135,000 kw. The dam itself is to be finished in spring of 1951. A railroad strike delayed start of concreting under stage 2 of the diversion scheme from September to Nov. 1, 1949, but concreting went through the winter at the rate of about 70,000 cu yd per month. One-third of the total 2,100,000 cu yd to be poured is in place, and the concreting rate is to be stepped up to 155,000 cu yd per month next summer.

ST. ANTHONY FALLS—A $19,500,000 harbor development project including two locks to scale this Upper Mississippi River waterfall is underway at Minneapolis. Lower pool dredging, stage two of the project, is to be completed in October. Then, work will follow this general order: (1) Lower lock and dam construction, (2) upper lock construction (3) upper pool dredging, and (4) intermediate pool dredging.

With combined bids on lower lock and lower dam received, it is expected that construction will begin after high water this spring. The upper lock will provide a lift of 49 ft, highest on the Mississippi River. Upon completion in from five to ten years, 4.6 additional miles of good harbor will be open to river traffic.

CHAIN OF ROCKS CANAL—The Chain of Rocks reach of the Mississippi River just above St. Louis, Mo. —last remaining hazard to navigation in 9-ft channel from New Orleans to Minneapolis and the Great Lakes—is being bypassed. An 8.4 mile canal averaging 35 ft in depth is being constructed parallel to the main course of the river on its Illinois (east) side. A 1,200-ft main lock and a 600-ft auxiliary lock at the canal's south end are 71% complete and will cost $17,737,000. Excavation of the canal itself has been under way since last summer at a contract cost totalling $70,370,000. Some 22,000,000 cu yd of excavation will be required to complete the canal, which will be 300 ft wide at its bottom and vary in depth from 10 to 45 ft. Excavated material is being used in levees along either side.

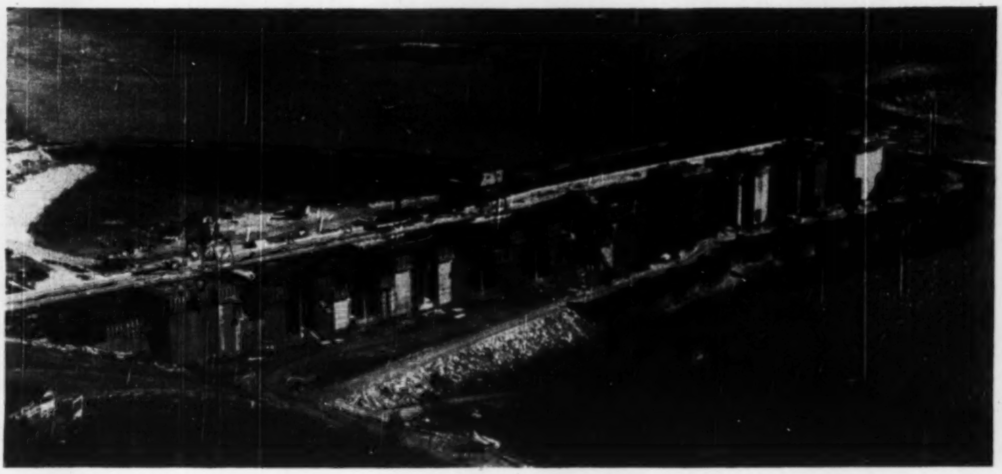
YAZOO RIVER BASIN—In the north-central section of Mississippi two earth-fill structures are being built by the Corps of Engineers for flood control—**Enid Dam** on the Yocona River and **Grenada Dam** on the Yalobusha. **Enid** is an 85-ft high 8,400 ft embankment with a 200-ft wide concrete spillway to be finished in 1952 at a cost of $15,250,000. **Grenada Dam** is similar, but 80 ft high and 13,900 ft long; it will cost $32,800,000 and be completed in 1953.

OUACHITA RIVER BASIN—**Narrows Dam** on the Little Missouri River near Murfreesboro, Ark., will be finished this year. There are $1,560,000 yet to be spent to bring its total cost to $13,450,000. It is a concrete structure 175 ft high and 940 ft long. Upstream on the Ouachita River, near Hot Springs, Ark., **Blakely Mountain Dam** is scheduled for completion in 1954. It is an earthfill structure 205 ft high and 1,100 ft long. Allotment of funds for 1950 is $3,000,000, and the total cost is to be $31,000,000. The spillway is complete and diversion tunnels are under construction. Dam and intake contracts should be soon under way.

TENNESSEE CHUTE PROJECT—Memphis, Tenn., has its harbor development 11% complete. The project is under supervision of the Corps of Engineers; cost to the federal government is to be $21,600,000, and local interests will contribute $28,600,000. **Tennessee Chute**, the present by-pass channel that forms Presidents Island in the Mississippi will provide off-river harbor for 7,800 acres of industrial site area. A 6,000,000-cu yd earthfill dam near the head of the channel will be built this year of material dredged from what is to be the harbor. On Presidents Island a 48,000,000-cu yd embankment will become a 960-acre industrial site at an elevation well above any foreseeable flood stage. Harbor channels will be 12 ft deep and 300 ft wide.

MISSISSIPPI FLOOD CONTROL—From Cairo, Ill., to a point 10 miles above the mouth of White River, Ark., the Corps of Engineers has stabilization of 221 miles of the Mississippi River's bank 47% completed. Revetment and dikes in this section—plus some on the Ohio River—are to cost $299 million. In 1950's low-water season 12 miles of new revetment are to be finished. Levee construction in this same area is 55% complete with 348 of 630 miles finished. Cost so far has come to $74,000,000; $3,000,000 are to be spent in 1950.

Farther downstream, levees on the west bank as far as the Arkansas River and on the east bank to the Yazoo are 95% complete. Revetment work in this same stretch of the Mississippi has reached a total length of 65 miles

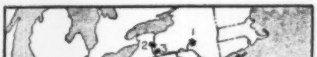


BUGGS ISLAND DAM on the Roanoke River in Virginia will cost more than $78,000,000. The Corps of Engineers has this dam about one-quarter finished and has started another, Philpott Dam, farther upstream.

with expenditure of $8,341,000 this fiscal year.

And on the southernmost length of the Lower Mississippi, levee construction is 97% complete and requires only some building up to grade or section and maintenance. Flood protection work continues on tributary streams. Over $60,000,000 has been spent, in all, on levees in this area.

The control structure for **Morganza Floodway** is well under way, and so is the railroad relocation required by it. This integral part of Lower Mississippi flood control is being built west of the river near Morganza, La., at a cost near $21,000,000. Its concrete portion, made up of 125 gates, each 31 ft 3 in wide, will carry a single track railroad and State Highway No. 30. Embankment approaches outside the floodway near 80% completion, and the main embankment within the floodway is almost 50% complete. Pile tests are under way for the concrete control structure which will be 3,906 ft long when completed in 1952. Then a channel will be excavated by 1953 to take Mississippi flood waters through the control structure, into the Atchafalaya River valley to the Gulf.



A LONG LIST of dams under construction spot the eastern states, mostly for flood control and power.

OHIO RIVER VALLEY – **Conemaugh Dam** on the Conemaugh River above Pittsburgh, Pa., was 18% complete at the end of last year, representing $1,540,000 worth of construction put in place. An estimated $3,800,000 worth of construction will be put in place this year bringing the percentage completed up to 61%. This concrete flood-control dam is scheduled for completion in June 1952 at a total cost of $8,760,000. The $6,910,000 navigation lock and dam on the **Monongahela River** at Morgantown, W. Va., originally scheduled for completion in May 1951, will be finished late this year. It was 65% complete on Jan. 1 leaving $2,460,000 worth of construction to be put in place this year.

Wolf Creek Dam on the Cumberland River in Kentucky was 80% complete on Jan. 1. Closure of the 240-ft high concrete and rolled-fill dam will be started this summer, with completion scheduled for Mar. 31, 1951. Powerhouse construction will start this spring and the entire $82,700,000 reservoir project should be finished by April 1953. It will provide storage for 6,089,000 acre-ft of water, and generate 270,000 kw of power. **Center Hill Dam** in Tennessee, a 240-ft high concrete and rolled-fill dam, is virtually complete, and the entire project is 83% finished. When completed in October 1951, this $45,700,000 reservoir project will store a total of 2,092,000 acre-ft of water and generate 135,000 kw of power.

Bids were opened last month for construction of an 800x110-ft lock on the **Cheatham Lock and Dam** project near Clarksville, Tenn. It is one of 12 authorized projects for the comprehensive development of the Cumberland River, and one of three projects authorized to provide a 9-ft navigable channel from the mouth of the Cumberland to Nashville. The entire project will cost $15,264,000.

LOUISVILLE FLOODWALL – Louisville's $26,000,000 floodwall construction program is about 55% complete, dollarwise. About 7 mi of earth levee and concrete floodwall in the 17.5-mi system have been completed and contracts for the remainder –mostly earth levee–will be awarded this year. Tentative completion date for the entire project is set for 1953.

TENNESSEE VALLEY–Work on **South Holston Dam** was 85% complete at year's end with over 5,000,000 cu yd of earth and rock fill placed. The 285-ft high structure is to be finished, and its one 35,000-kw unit in operation, by next November.

Watauga Dam, finished in 1948, had its two 25,000-kw generators installed during 1949. And throughout the Tennessee Valley, generating units are being put into operation in space provided when dams were built. Also, dams taken over from private power companies have been raised and given additional capacity. Some 198,000 kw of rated capacity were added to TVA's system in 1949 and 659,400 kw more are to be made available by the end of 1952, when the total system capacity is to reach near 4,000,000 kw.

SOUTHEASTERN STATES—On the Etowah River in Georgia—about 48 miles upstream from Rome—**Allatoona Dam** is about 93% complete; filling of the reservoir began in December and power production began Feb. 1. Planned fundamentally for flood control, this initial project for development of the Alabama-Coosa river system has an initial power installation of 74,000 kw. The dam is a gravity-type concrete structure with gate controlled spillway rising 190 ft above the river bed.

Jim Woodruff Dam and lock near 11% completion on the Georgia-Florida line, where the Chattahoochee and Flint rivers join to form the Apalachicola River. The entire project, estimated at $42,208,000, will include dam, lock and power plant. The dam will have a 33-ft head and be 6,140 ft in length. An overflow dike section 3,310 ft long was completed last year. The lock and fixed crest spillway sections, comprising 1,740 ft of the dam's length, are about 15% complete and scheduled to be finished in October 1951. The project's power output is to be 30,000 kw.

Upstream in the same watershed, the Corps of Engineers has taken bids on the first contract on construction of $40,000,000 **Buford Dam** on the Chattahoochee River 35 miles northeast of Atlanta, Ga. Although still under study, this 192-ft high earthfill structure is to be under construction later this year when designs are to be sufficiently complete.

Construction began in January at **Demopolis**, Ala., on a lock and dam to cost $21,000,000. The dam will consist of a concrete gravity-type open-crest spillway 1,405 ft long. It will cross the Tombigbee river 218 miles above Mobile, Ala., where it flows into the Gulf of Mexico. The lock will pass river traffic bound northward from Mobile and the Gulf.

Clark Hill Dam is about 40% finished on the Savannah River near Augusta, Ga. This Corps of Engineer project is to cost $76,000,000; $32,700,000 were spent during this fiscal year. During the spring 400,000 cu yd of concrete are being placed in the non-overflow section of the dam, and work is to begin on power plant foundations.

ROANOKE RIVER BASIN—In Virginia near the North Carolina line, **Buggs Island Dam** is 27% complete on the Roanoke River. The $78,870,000 flood control and power development project is first of 11 projects in a comprehensive plan recommended by the Corps of Engineers for the valley, and approved by Congress in 1944. It is a 2,785-ft long concrete gravity structure with earth wing walls totaling over 19,000 ft in length. A 1,092-ft spillway will have 22 tainter gates; maximum dam height is 144 ft. Initial power installation will be 90,000 kw. The powerhouse contract soon will be let.

The second and only other project authorized so far for the valley is $13,000,000 **Philpott Dam**, now 17% complete on Smith River in the upper watershed 34 miles south of Roanoke, Va. To be 892 ft long and 220 ft high, the concrete structure is well under way; reservoir clearing is to start this summer.

CENTRAL AND SOUTHERN FLORIDA—Levee construction and other flood protection around **Lake Okeechobee**, and from there south along the Atlantic Coast, is just starting under a recommended $208 million program. Congress has authorized the first phase ($70,000,000 worth) and the Corps of Engineers has started work on a portion to cost $4,000,000. This portion involves 41 miles of 5-, 10 and 12½-ft high levees totaling 10,000,000 cu yd; it is to be about 47% complete by June 30.

SUSQUEHANNA RIVER BASIN—For local flood protection the Corps of Engineers has projects under way at **Williamsport** and **Sunbury**, Pa., and **Elmira**, N. Y. **Williamsport** work, estimated at $17,000,000, is about 45% complete and already affords substantial protection to the city's business district. Additional work estimated to cost $1,500,000 is scheduled to start this year. The overall project includes 54,000 ft of levee, 7,600 ft of concrete floodwall, nine pumping stations, and relaying of railroad track. On the Susquehanna and Shamokin Creek at **Sunbury**, the project will cost $7,300,000 it is 75% finished and scheduled for completion next November. It includes 14,000 ft of earth levee, 13,100 ft of concrete floodwall, 12,000 ft of interceptor sewer and miscellaneous appurtenant structures. Along the Chemung River and tributary streams within the city of **Elmira**, flood protection costing $7,100,000 is now over 92% complete. Protective work includes 58,000 ft of earth levee, 10,400 ft of concrete flood wall, a concrete pressure conduit 2,000 ft long and 6000 ft of interceptor sewer.

Also in the Susquehanna basin two control reservoirs were completed last year. **East Sidney Reservoir** on Ouleout Creek four miles above its confluence with the North Branch of the Susquehanna River near Binghamton, N. Y., is 128 ft high and 2,000 ft long; its concrete gravity section with overflow spillway is 750 ft long. Cost of the project is $6,240,000. **Almond Reservoir** was also completed near Hornell, N. Y., for flood control on Canacadea Creek. It has a rolled earth embankment 1,350 ft long and 90 ft high, a concrete spillway and a gate-controlled tunnel outlet.

GENESEE RIVER—Control of this northward flowing stream that empties into Lake Ontario at Rochester, N. Y., is to be accomplished by **Mt. Morris Dam**. The concrete gravity dam will be finished by the Corps of Engineers, in 1952 at a cost over $24,000,000. It is now 38% complete with monoliths 1, 3 and 5 poured 125-ft high and the river diverted over low monoliths 2 and 4. Constructors are preparing to resume concrete placing beyond monolith 5 by May 1. Cofferdams surround next summer's work space, and excavation is continuing in preparation for it. The dam will have a 550-ft center spillway with a 216-ft crest height. Some 337,000 acre-ft will be held in the gorge it will close. Nine 2,700 cfs conduits will pass through the structure to carry normal river flow.

NEW ENGLAND—Two earthfill dams were completed for flood control of Connecticut River tributaries last year by the Corps of Engineers—$834,000 **Tully Dam** on the Tully at Royalston, Mass., and $2,375,000 **Union Village Dam** on the Ompompanoosuc at Thetfort, Vt.

As part of another flood control system, **Mansfield Hollow Dam** was begun in 1949 and is now 8% completed on the Natchaug River, tributary of the Thames. This 12,500 ft long earthfill dam is to be built for about $3,289,000 near Willimantic, Conn. Work involves 2,400,000 cu yd of excavation and a considerable amount of earthmoving.

And in the Merrimac River flood control system, **West Peterborough Dam** was completed during the year on Nubanusit Brook near West Peterborough, N. H., at a cost of $1,300,000.

1949-50 ANNUAL REPORT ON

Construction Costs

BY ENGINEERING NEWS-RECORD

Despite the fact that engineers and contractors won an impressive victory over rising construction costs during 1949, there will be no let up in the battle during 1950.

Bid prices last year were brought down 10 to 20% on the average, and more on some individual projects. Yet the prices contractors had to pay for materials came down only 5%, and wage rates actually increased, also 5%. Engineers did their bit by being more precise in their specifications and by giving contractors a choice of alternate design. Contractors, on their part, bid more competitively, dropped contingency allowances previously included to cover uncertainties as to materials deliveries and wage demands. In the face of these efforts the ENR Construction Cost Index ended the year at its all-time high.

In 1950, therefore, engineers and contractors are again going to have to operate at a high price level. There is, moreover, no single item, like contingencies, that can be cut from costs, to effect a substantial saving. Instead, close estimating, improved management and greater over-all efficiency must be relied upon to keep costs down and profit margins up. Information on costs and cost trends will, therefore, be a major requirement for success. The pages that follow present that information in a form and scope that are planned to give it maximum usefulness.

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ENR Construction and Building Cost Indexes, Aberthaw, AGC, American Appraisal, Austin, Boeckh, Fruin-Colnon, Fuller, Marshall & Stevens, Smith, Hinchman & Grylls, Turner, WR Assoc., Public Utility, ICC Railroad, BPR & California Roadbuilding, USED concrete and earth dam, AIEE Electric wiring.

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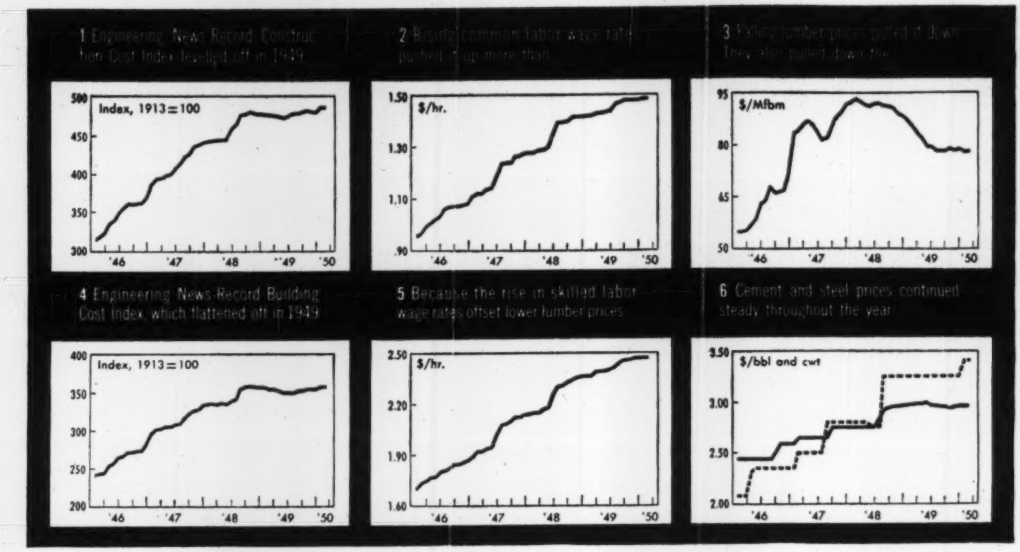


1 Engineering News-Record Construction Cost Index levelled off in 1949

2 Rising common labor wage rates pushed it up more than

3 Falling lumber prices pulled it down. They also pulled down the

4 Engineering News-Record Building Cost Index, which flattened off in 1949

5 Because the rise in skilled labor wage rates offset lower lumber prices

6 Cement and steel prices continued steady throughout the year

The Outlook for Construction Costs in 1950

Construction men can expect a squeeze play on construction costs in 1950 between the slightly higher prices they will have to pay for materials and labor and the increased competition they face for jobs. Both the sharper bidding and the gentle price rise developed in the latter half of 1949 are continuing into 1950.

The stability that marked prices and wages last year also promises to continue into 1950 along with ample production of materials and supply of labor to meet the volume of work in sight. The ENR cost indexes (which measure the movement in materials prices and wage rates) should vary from their 1949 values not more than 5% and could hold inside an even smaller range. It will all depend on the new wage contracts.

Lumber prices have ended their long slide down and are up a little—at least temporarily—due to bad weather in the fir producing Northwest. The housing boom is also keeping lumber moving and taking the pressure off prices. The steel mill price increase to date has been partly absorbed in the warehouses, and on mill orders may be absorbed in close bidding in the most competitive market since the war.

New labor contracts will come through in April, May and June, with some hold-the-line contracts in sight and some small increases, certainly no more than last year and probably less.

The low bids in 1950 will have to be backed by good engineering, good management and high job productivity.

History and Use

The **ENGINEERING NEWS-RECORD Construction Cost Index** was established in 1921, based on structural steel, portland cement, lumber and common labor. The ENR Building Cost index was added in 1938 to measure the effect of skilled wage trends on costs. It uses the same materials as those in the construction cost index but skilled labor, instead of common labor. A few minor changes have been made in these indexes over the years necessitated by changed conditions in the market. These are recorded in full, together with a complete history of the development and use of these indexes, in ENR, September 1, 1949, page 398.

New values are reported at the beginning of each month, based on 1913 = 100. These are weighted aggregative indexes, so base years can be shifted at will. Conversion factors and values of these indexes are shown in the accompanying tables using years 1926, 1939 and 1940 as bases.

Base Conversion Table

To change base years for Engineering News-Record Construction and Building Cost Indexes, divide by following conversion factors:

To convert From Base 1913 = 100 To Base below:	Divide 1913 = 100 values for Construction Cost Index by	Divide 1913 = 100 values for Building Cost Index by
1940 = 100	2.4196	2.0281
1939 = 100	2.3551	1.9744
1926 = 100	2.0803	1.8499
1925-29 = 100	2.0695	1.8648
1929 = 100	2.0702	1.9086
1910-14 = 100	0.9380	0.9477
1924 = 100	2.1536	1.8578
1923-25 = 100	2.1204	1.8481
1914 = 100	0.8856	0.9191
1911 = 100	0.9343	0.9414

ENR Cost Indexes

Year	Engineering News-Record Cost Indexes — Construction			Building		
Base	'26	'39	'40	'26	'39	'40
1926	100.0	88.3	85.9	100.0	93.6	91.2
1927	99.1	87.5	85.2	100.6	94.4	91.7
1928	99.4	87.8	85.4	101.6	95.2	92.6
1929	99.5	87.9	85.5	103.1	96.6	94.1
1930	97.5	86.1	83.8	100.2	93.9	91.4
1931	87.1	77.0	74.9	91.3	85.7	83.5
1932	75.4	66.6	64.8	75.7	71.3	69.4
1933	81.8	72.2	70.3	79.5	74.8	72.8
1934	95.2	84.1	81.8	90.1	84.4	82.1
1935	94.4	83.4	81.8	89.6	83.9	81.7
1936	99.2	87.6	85.3	93.1	87.2	84.9
1937	112.7	99.6	97.0	106.1	99.3	96.7
1938	113.3	100.1	97.4	106.4	99.6	97.0
1939	113.2	100.0	97.3	106.7	100.0	97.3
1940	116.3	102.7	100.0	109.6	102.7	100.0
1941	124.0	109.4	106.5	114.3	107.1	104.2
1942	132.8	117.3	114.1	120.2	112.6	109.6
1943	139.4	123.1	119.8	123.7	115.8	112.8
1944	143.6	126.8	123.4	126.9	118.8	115.7
1945	147.9	130.6	127.2	129.3	121.1	117.8
1946	166.3	146.9	143.0	141.8	132.9	129.4
1947	198.6	175.4	170.8	169.2	158.5	154.3
1948	221.5	195.6	190.4	186.2	174.5	169.9
1949	229.3	202.5	197.1	190.2	178.2	173.4

ENGINEERING NEWS-RECORD
CONSTRUCTION AND BUILDING COST I

ENGINEERING NEWS-RECORD CONSTRUCTION COST INDEX

	1926	1932	1939	1942	1945	1946	1947	1948	1949	1950
Jan.	207.2	162.5	234.7	267.6	302.5	316.3	387.0	441.7	477.4	484.7
Feb.	206.6	161.8	234.3	269.4	303.7	319.5	393.7	442.7	475.4	484.9
Mar.	207.7	157.2	234.4	269.7	304.5	323.8	395.5	443.6	474.8	....
Apr.	207.1	153.1	234.9	271.8	306.4	334.6	399.6	443.6	474.3	....
May	207.3	152.8	234.7	272.3	307.4	339.7	400.0	444.9	472.1	....
June	204.8	152.2	235.0	274.2	309.0	348.7	406.6	455.8	473.8	....
July	207.8	153.4	234.9	277.7	309.0	354.7	413.8	464.8	477.5	....
Aug.	208.3	156.8	234.9	281.6	309.1	361.4	422.9	477.1	478.2	....
Sept	208.3	158.0	235.0	281.6	309.3	360.2	426.4	478.4	479.8	....
Oct.	209.8	159.2	236.9	282.4	309.3	360.9	434.6	480.2	480.5	....
Nov.	210.8	158.2	238.2	283.6	309.3	362.5	436.9	478.3	480.0	....
Dec.	210.8	158.5	238.2	283.7	313.5	369.3	441.1	477.7	480.3	....
Aver.	**208.0**	**157.0**	**235.5**	**276.3**	**307.8**	**346.0**	**413.2**	**460.7**	**477.0**	....

THE ENGINEERING NEWS-RECORD Construction and Building Cost Indexes reflect wage rate
price trends. They do not adjust for labor efficiency, materials availability, competitive conditic
ment, mechanization or other "intangibles" affecting construction costs.

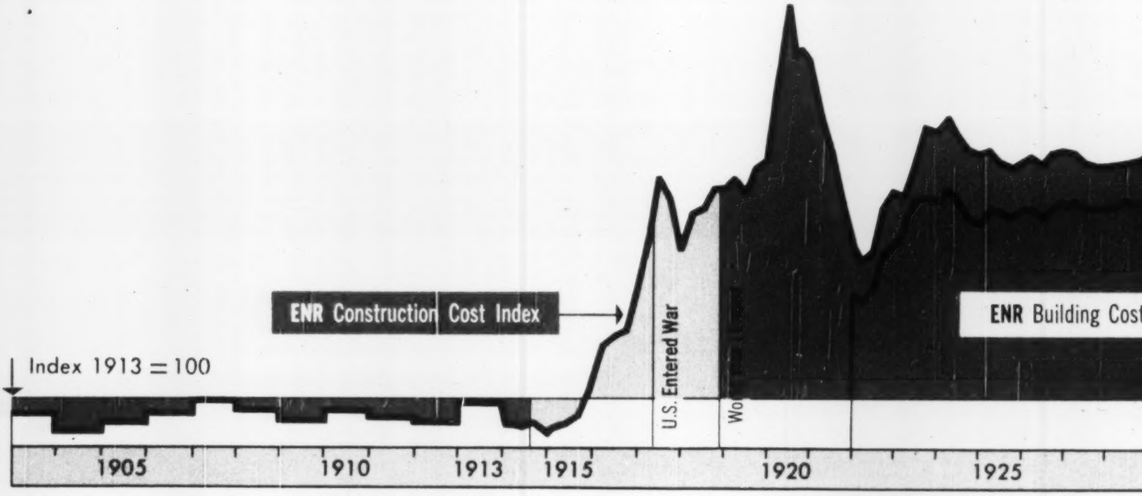
A hypothetical block of construction requiring 6 bbls. of cement, 1.088 M ft. bm. of lumber, 2,50
and 200 hours of common labor is used to measure the trend of the cost of heavy engineering

The building cost index is based on a similar hypothetical block using the same quantities
but 68.38 hours of skilled labor.

This simple structure was adopted to facilitate prompt reporting of changes due to price an
movements, both as to direction and degree.

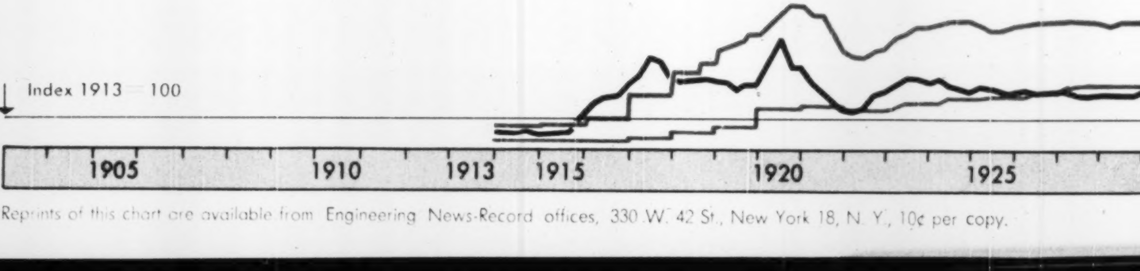
Both indexes have proved, over the years, infallible as to direction and, in normal times,
accurate as to degree. Under abnormal conditions of increasing or decreasing job productivit
for the "intangibles" listed above should be made in measuring the degree of change in overa
costs, or of construction selling price.

For complete details on construction and use of these indexes see ENR September 1, 1949, pa



Trends in Materials Prices and Wage Rates Used in ENR Inde

- ■ **MATERIALS:** lumber, steel, cement
- ■ **SKILLED LABOR:** carpenters, ironworkers, bricklayers
- ■ **COMMON LABOR:** building, heavy construction



Reprints of this chart are available from Engineering News-Record offices, 330 W. 42 St., New York 18, N. Y., 10¢ per copy.

INDEXES

ate and material
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and wage rate

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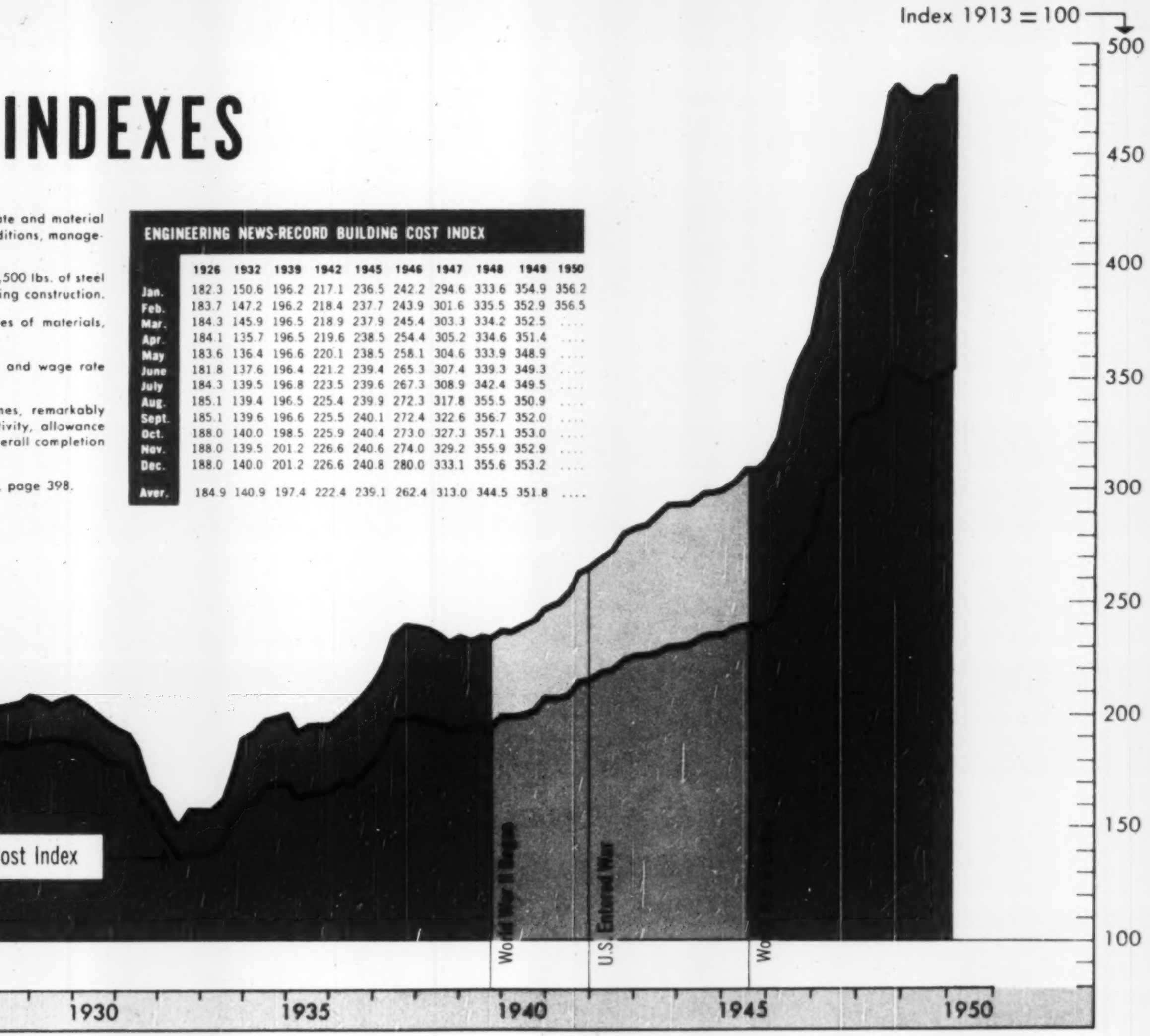
. page 398.

ENGINEERING NEWS-RECORD BUILDING COST INDEX

	1926	1932	1939	1942	1945	1946	1947	1948	1949	1950
Jan.	182.3	150.6	196.2	217.1	236.5	242.2	294.6	333.6	354.9	356.2
Feb.	183.7	147.2	196.2	218.4	237.7	243.9	301.6	335.5	352.9	356.5
Mar.	184.3	145.9	196.5	218.9	237.9	245.4	303.3	334.2	352.5	....
Apr.	184.1	135.7	196.5	219.6	238.5	254.4	305.2	334.6	351.4	....
May	183.6	136.4	196.6	220.1	238.5	258.1	304.6	333.9	348.9	....
June	181.8	137.6	196.4	221.2	239.4	265.3	307.4	339.3	349.3	....
July	184.3	139.5	196.8	223.5	239.6	267.3	308.9	342.4	349.5	....
Aug.	185.1	139.4	196.5	225.4	239.9	272.3	317.8	355.5	350.9	....
Sept.	185.1	139.6	196.6	225.5	240.1	272.4	322.6	356.7	352.0	....
Oct.	188.0	140.0	198.5	225.9	240.4	273.0	327.3	357.1	353.0	....
Nov.	188.0	139.5	201.2	226.6	240.6	274.0	329.2	355.9	352.9	....
Dec.	188.0	140.0	201.2	226.6	240.8	280.0	333.1	355.6	353.2	....
Aver.	184.9	140.9	197.4	222.4	239.1	262.4	313.0	344.5	351.8	....



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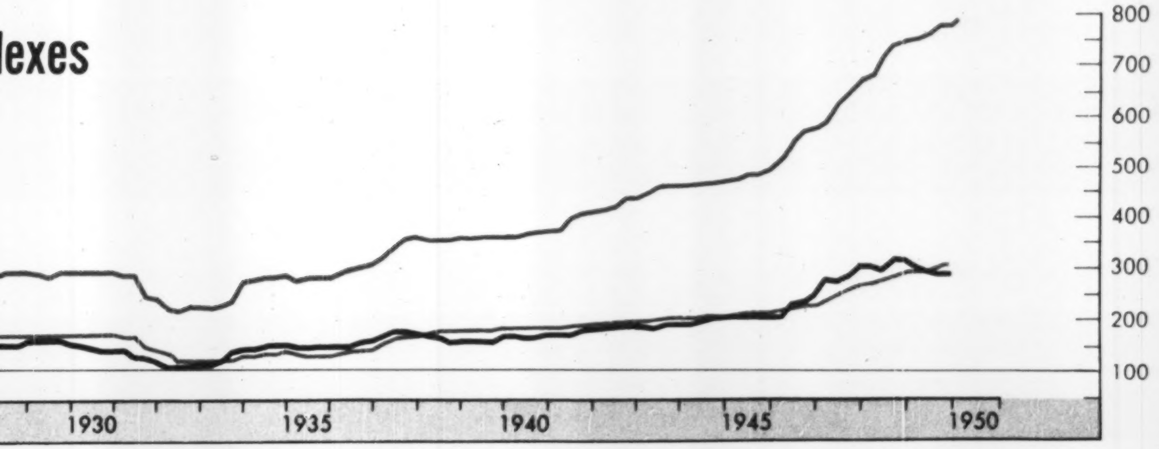
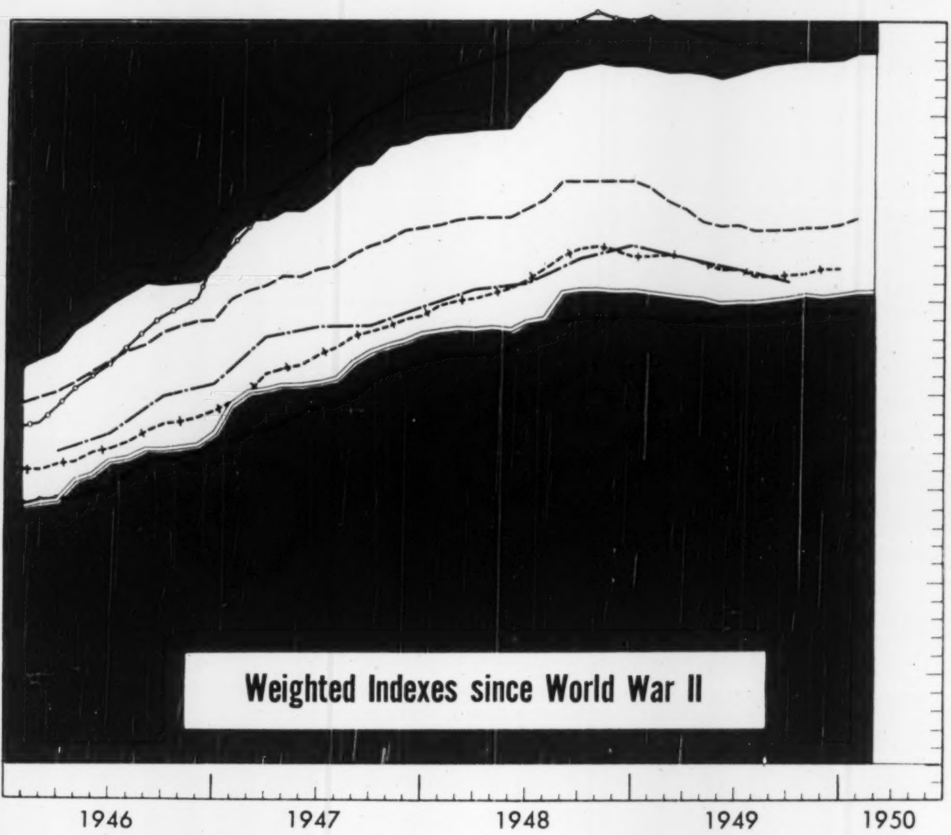


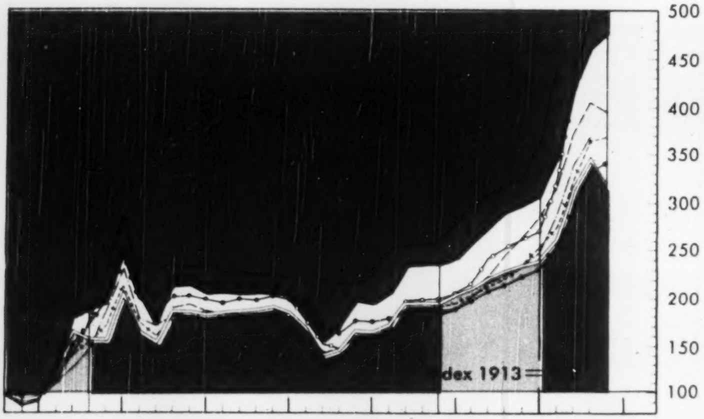
ENR BUILDING AND CONSTRUCTION C

Index 1913 = 100 —



Weighted Indexes since World War II

Weighted Indexes through World War II



WEIGHTED INDEXES

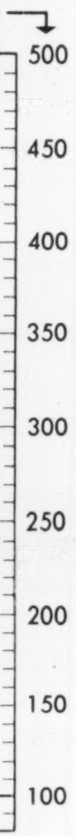
		1926	1932	1939	1942	194
ENR Construction	━━━	208	157	236	276	308
ENR Building	═══	185	141	197	222	239
American Appraisal*	—o—o—	217	155	200	241	271
Assoc. Gen. Contr.	—●—●—	197	171	188	209	231
Boeckh. U. S. aver.	-+--+-	181	144	191	214	252
Marshall & Stevens	—·—	185	130	183	218	248
Smith, Hinchman & Grylls*	— — —	185	128	199	226	285

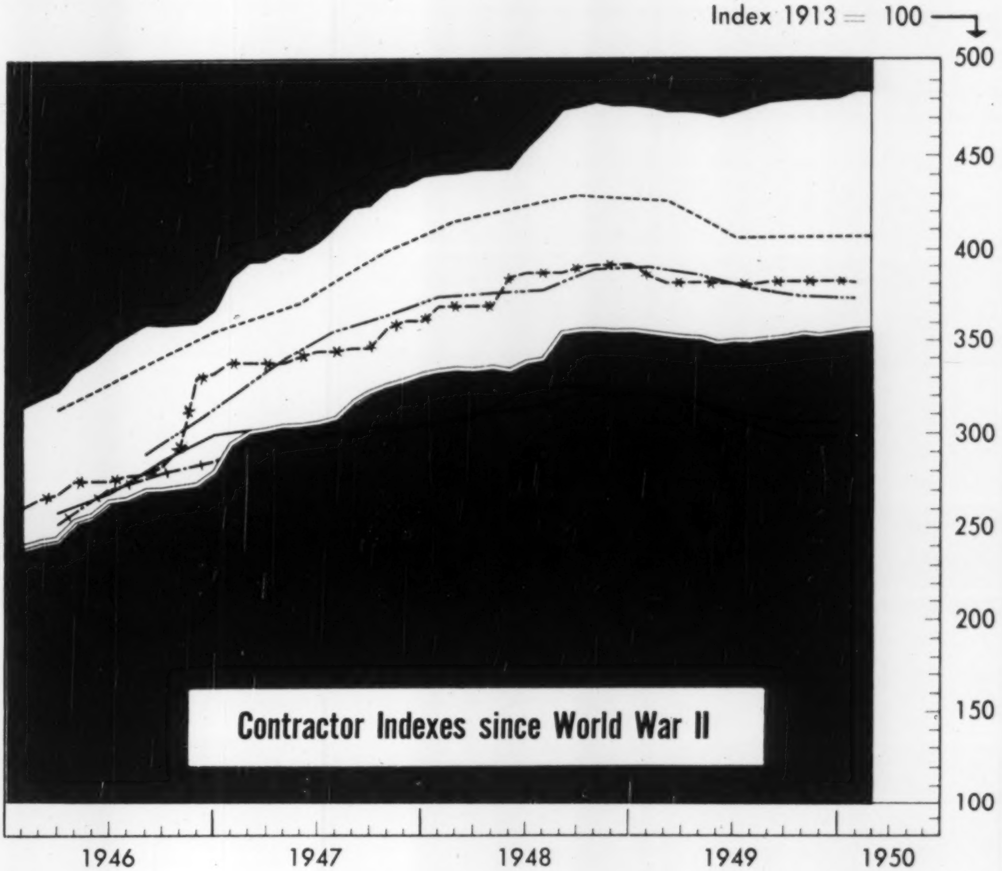
*Correct for productivity

CONTRACTOR INDE

Aberthaw (1914 = 100)
Austin
Fruin-Colnon
Fuller
Turner

COST INDEXES COMPARED WITH OTHERS



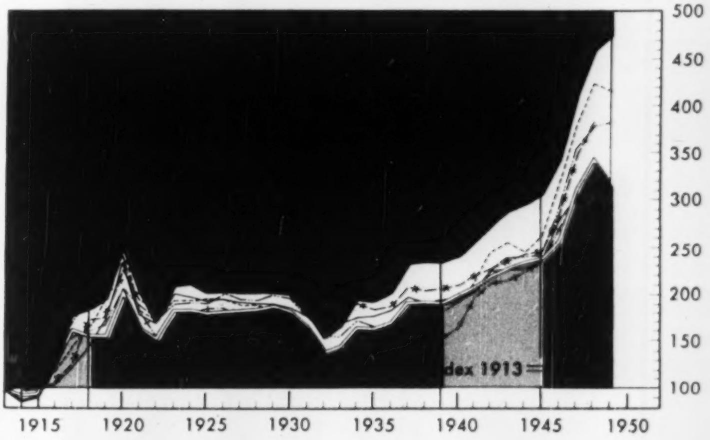


Contractor Indexes since World War II

1945	1946	1947	1948	1949
308	346	413	461	477
239	262	313	345	318
271	322	430	490	490
231	257	296	332	342
252	275	323	365	369
248	288	338	368	365
285	319	371	405	395

y

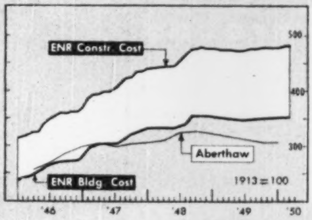
Contractor Indexes through World War II



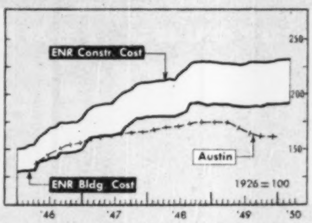
NDEXES

	1926	1932	1939	1942	1945	1946	1947	1948	1949
——	197	168	190	223	236	279	304	321	312
—+·+—	185	117	152	213	234	273	301	317	307
—✱—	218	178	208	227	247	285	347	382	381 8
—·—·—	202	157	195	229	241	290	354	380	382
------	195	136	182	245	263	318	380	422	414

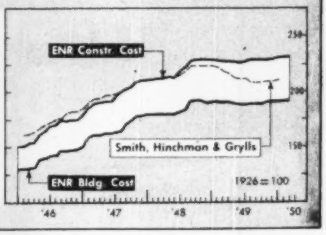
Building cost indexes defined and compared



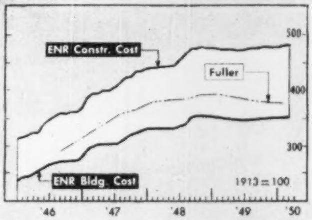
Aberthaw Co., Boston, Mass.—Since March 31, 1946, a composite of 36 major cost items in three multi-story and two one-story New England industrial buildings, including all mechanical trades. Repriced quarterly using actual and estimated labor and material costs. Base: 1914 = 100. (Prior to March 31, 1946, based on New England seven-story and basement, 62′4″ x 202′4″, reinforced concrete building built in 1914.



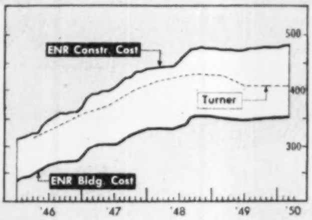
Austin Co., Cleveland, Ohio.—Reprices typical one-story, steel frame, monitor type industrial building. Includes concrete foundations; brick curtain walls; continuous steel sash; concrete floor laid on ground; 2-in. wood roof deck on timber purlins covered with 4-ply waterproofing, monitor sash with mechanical operators, but no heating, lighting, plumbing, sprinkler or other services. Priced quarterly for central and eastern states. 1926 = 100.



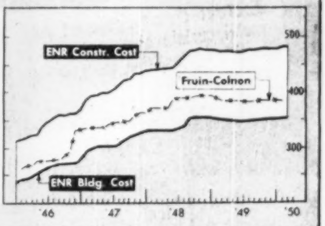
Smith Hinchman & Grylls, Inc., Detroit, Mich.—Actual in-place costs, using building material costs, freight rates, skilled and unskilled labor rates and including labor efficiency and premiums, bidding competition, contractor profit margins and overhead. Figured with the contractor overhead are taxes, duration of projects, material expediting and labor procurement. This index, is reported monthly on a 1926 = 100 base.



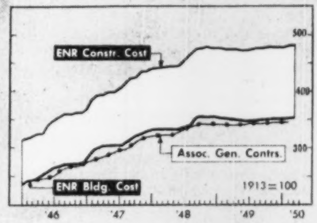
George A. Fuller Co., New York, N. Y.—Composite of 36 major cost elements, in three commercial type buildings, including mechanicals, elevators, wiring, heating and ventilating, repriced.



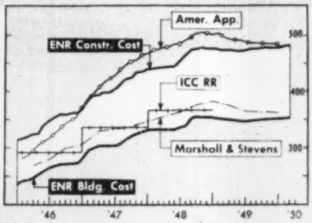
Turner Construction Co., New York, N. Y.—Eastern cities. Own cost experience on labor rates, material prices, productivity of labor, efficiency of plant, competitive conditions, forecast of price trends.



Fruin-Colnon Contracting Co., St. Louis, Mo.—Industrial plant of five buildings in St. Louis repriced monthly on basis of contractor's actual and estimated material and labor costs.



Associated General Contractors of America (AGC), Washington, D. C.—Wages and materials for 12 cities combined in 40-60 ratio. Wages, prevailing rates for hod carriers and common labor. Materials, weighted: sand, gravel and crushed stone, 1; cement, 1; lumber, 1; hollow tile, ½; structural and reinforcing steel, ½.

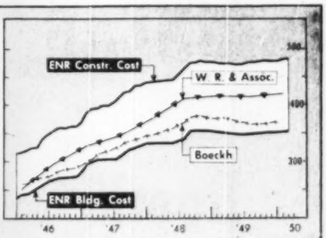


Additional building cost indexes are defined and reported in detail in the accompanying pages. These include:

American Appraisal Co., Milwaukee, Wisc.

ICC Railroad—Sta & Off Bldgs.

Marshall & Stevens, Chicago, Ill.



Whitman, Requardt & Associates, Baltimore, Md.— Reinf. Concr. Bldg., Pacific Div.

E. H. Boeckh & Assoc.—National average composite industrial building used in charts, not shown in detail in accompanying tables.

Indexes based on 1926 = 100 or 1926-29 = 100 are converted to 1913 = 100 for comparing with other indexes on charts plotted on the 1913 = 100 base.

For all-around year-around

Door Efficiency

High Efficiency! Doors coil overhead, clear the entire opening, from jamb to jamb and floor to lintel!

Lowest Repair Costs! If accidentally damaged, slats in the door curtain are easy to replace individually, as needed.

Extra Protection! All-metal curtain gives extra protection against fire, theft, wind, and weather.

Extra Space! Doors coil above opening; need no usable floor, wall or ceiling space for either storage or operation.

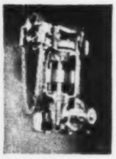
Safe from Damage! Doors open completely out of the way, remain out of reach of damage by wind or vehicles!

Convenience! With smooth, easy, upward action, Kinnear Rolling Doors save time and labor.

Extra Durability! The resilience of Kinnear's strong all-metal curtain absorbs blows that damage many doors.

Longer-Lasting! Records show that many Kinnear Doors have been in continuous daily use for 40 years or more.

KINNEAR Rolling Doors



In addition to features highlighted above, Kinnear Rolling Doors have many other advantages that help cut *plant costs and operating costs* as well as door costs.

By coiling compactly above the lintel, they not only save floor and wall space, but also leave ceiling space clear, permitting unimpeded use of overhead cranes, conveyors, and similar equipment. Materials can be stacked *ceiling-high*, if desired, only a few inches from the door curtain, without blocking its smooth, easy operation.

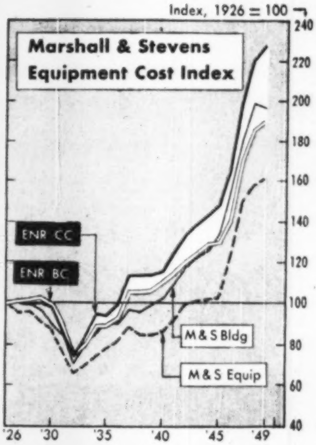
With modern pushbutton control, Kinnear Rolling Doors save time and labor, often eliminating the need for a door attendant. Any number of control switches may be used at remote points. The resulting ease and convenience of operation leads to speedier closing of doors, which means important savings on heating and air-conditioning costs.

These are only a few of the many reasons why Kinnear Rolling Doors are so widely used in all types of commercial, industrial and institutional buildings everywhere. Available any size, they are always built to fit the individual opening, for easy installation in new or old buildings. Write today for complete information.

Offices and
Agents in Principal
Cities

Saving Ways in Doorways
KINNEAR
ROLLING DOORS

The KINNEAR Manufacturing Company
Factories:—1820-40 Fields Avenue, Columbus 16, Ohio
—1742 Yosemite Ave., San Francisco 24, Calif.



American Appraisal Co. Building Cost Index

	'26	'32	'39	'42	'45	'46	'47	'48	'49
U. S. Av., 30 cities	**217**	**155**	**200**	**241**	**271**	**322**	**430**	**490**	**490**
Boston	224	169	210	248	270	320	420	477	485
New York	234	170	219	248	272	327	441	508	503
Buffalo	219	157	205	247	279	328	440	503	506
Baltimore	224	166	198	248	277	335	445	507	510
Philadelphia	225	161	196	247	275	317	417	477	481
Pittsburgh	236	172	219	249	279	325	424	486	486
Cincinnati	217	157	209	242	272	317	422	483	477
Cleveland	233	160	206	245	268	319	431	494	485
Chicago	219	162	205	235	260	303	404	456	452
Indianapolis	219	157	206	247	276	327	440	501	501
Detroit	224	148	208	252	278	335	441	504	500
Milwaukee	218	144	209	254	280	328	437	499	493
Minneapolis	197	148	202	235	266	310	401	455	453
Kansas City	220	156	209	239	268	321	420	480	469
St. Louis	230	163	208	238	265	314	422	478	478
Atlanta	211	147	186	240	278	344	457	521	514
Dallas	204	146	171	209	246	291	397	451	455
New Orleans	217	145	194	234	277	324	429	493	501
Denver	204	149	195	226	245	297	393	443	441
Seattle	199	141	196	244	277	324	443	506	509
San Francisco	188	144	183	225	244	297	401	446	446
Los Angeles	195	141	167	213	249	307	422	473	475

• **American Appraisal Company,** Milwaukee, Wis.—This index is based on detailed analysis of materials and labor required for four types of buildings (frame, brick, concrete and steel) in 30 representative cities. It is repriced monthly in accordance with: 1. prevailing wage scales and labor performance for the various building trades, and 2. quotations for construction materials in 30 key cities in the United States. The index corrects for labor productivity but assumes normal average conditions and does not give any recognition to overtime or bonus payments to labor or premiums paid for materials in individual cases or under temporary abnormal conditions. It applies to construction only, does not include plumbing, heating, lighting, sprinklers, fixtures and decorations.

Canada index of basic construction costs

By Central Mortgage & Housing Corp.—1939 = 100.

				1949			
1945	137.8	'47	173.6	Jan	208.7	Jul	209.3
1946	147.7	'48	200.0	Apr	209.7	Oct	209.6

Weighted index of wholesale prices and wage rates including vacation pay allowances. Intangibles, productivity, etc., not included.

Equipment Costs Indexes—1926 = 100

Industry	1929	1932	1939	1945	1946	1947	1948	1949	12/49
Average of All	**91.9**	**66.1**	**84.8**	**103.4**	**123.2**	**150.6**	**162.8**	**161.2**	**159.4**
Commercial (aver. of 12*)	91.8	67.6	86.8	105.2	120.9	146.9	158.6	152.7	150.3
Transportation—garage	91.5	69.2	83.6	100.9	123.9	157.0	171.1	170.3	168.1
Public utility (aver. of 2*)	91.8	70.1	82.9	97.5	119.5	145.8	159.6	159.7	158.5
Process (aver. of 9*)	90.5	73.2	83.6	103.8	123.0	149.1	161.9	161.1	159.8
Food (aver. of 10*)	92.6	68.5	84.9	104.1	126.1	156.8	169.7	169.2	167.6
Metal working	92.3	67.9	83.6	110.7	131.2	151.3	161.8	161.8	160.6
Aircraft	93.0	66.7	85.0	109.8	127.0	162.9	178.3	177.5	175.5
Mach. and parts, elec. equip.	92.0	68.0	83.4	106.8	130.3	156.6	167.4	167.7	167.4
Textile	91.1	67.8	83.7	101.8	122.1	146.6	157.4	157.3	156.5
Woodworking	92.0	67.2	83.6	100.9	123.0	149.6	160.4	160.4	159.2
General (aver. of 7*)	95.5	68.8	84.6	103.2	122.0	149.7	162.0	161.8	159.8
Cold Storage—refrigerating	92.0	70.0	82.1	101.7	125.7	163.2	176.6	175.8	173.6
Contractors' equipment	91.0	71.9	82.4	102.5	124.2	150.3	161.1	161.1	159.9

• **Marshall and Stevens,** Chicago, Ill.—Indexes cover both comparative building costs, 1902 to date, and comparative equipment costs, 1913 to date. The building indexes are national averages with a system of modifiers to get regional and municipal values for each of four types of building. A. Fireproof, protected steel, B. Fireproof, reinforced concrete, C. Masonry buildings, D. Frame. They are designed to reflect normal costs in line with recognized or published prices of building materials, equipment and labor. Extraordinary or intangible conditions are not included. Composite building cost series is converted to 1913 = 100 where compared with other indexes.

Comparative equipment costs, developed to cover the composite of the entire plant, machinery of various kinds, mechanical installation, furniture and fixtures, hand tools and other and combined in proper proportion to their average occurrence in each plant are computed for 47 industries. Eleven series are reproduced here, five of which are averages of 3 or more M&S related series. These are M&S estimates of actual costs paid for installed plant equipment, as a whole.

*** In each of these, MARSHALL AND STEVENS reports separate comparative equipment cost trends for:**

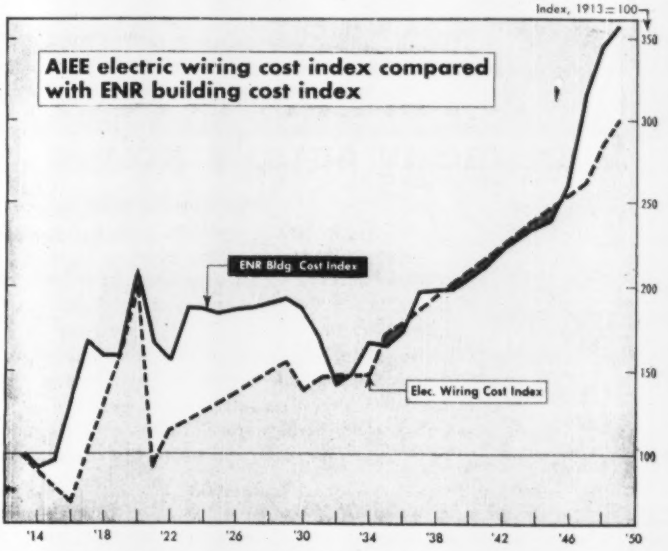
COMMERCIAL: Apartment, Bank, Church, Hotel, Library, Restaurant, School, Store, Theatre, Hospital, Dwelling, Office

PUBLIC UTILITY: Steam Power, Electric Power

PROCESS: Distillery, Cement, Chemical, Glass, Petroleum Industry, Paint, Paper, Rubber, Clay Products

FOOD: Bakery, Bottling, Brewery, Candy, Cannery-fish, Cannery-fruit, Creamery, Dairy, (Flour, cereal feed), Packing-fruit, Packing-meat

GENERAL: Laundry, Mining and Milling, Motion Picture, Printing, Shipbuilding, Warehouses, Logging



THE AIEE ELECTRIC WIRING COST INDEX shown on the accompanying chart is from a comprehensive report on "Method of Determining the Approximate Cost of Electric Wiring Systems," Section G, by AIEE Subcommittee on Interior Wiring Design for Commercial Buildings, of the Industrial Power Systems Committee, published by American Institute of Electrical Engineers, 33 W. 39 St., New York, N. Y., Oct. 1949.

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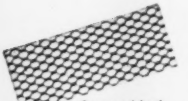
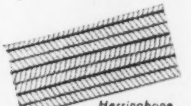
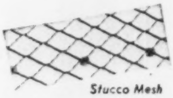

Diamond Lath

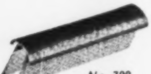

Herringbone Doublemesh Lath

⅜-inch Ribplex Lath

Self-Sentering Lath

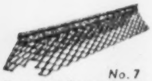

Stucco Mesh

No. 8 Rib Steel Corner Bead


No. 700 Partition Cap

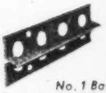
No. 49 Curved Point Base Screed With Corner Fittings

No. 72 Wide Flange Casing


No. 7 Expanded Corner Bead

No. 604 Bull Nose Corner Bead – ¾" Radius

No. 607 Bull Nose Corner Bead – 1½" Radius


No. 1 Base Screed – Flush Type

No. 15½ Scalloped Edge Corner Bead

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TRUSCON STEEL COMPANY
Subsidiary of Republic Steel Corporation
YOUNGSTOWN 1, OHIO
Warehouses and sales offices in principal cities

Boeckh index of building costs—U S average 1926-'29=100

Annual Averages By Cities	Residences		Apartments, Hotels, Office Bldgs.			Commercial & Factory Bldgs.				
			Brick and					Brick and		
	Frame	Brick	Wood	Conc.	Steel	Frame	Steel	Wood	Steel	Conc.
U. S. AVERAGE										
1926–29	101.4	102.5	102.5	102.8	101.3	102.2	100.8	101.7	102.2	104.6
1939	101.2	104.4	104.1	111.2	109.4	101.3	110.4	105.0	112.1	113.3
1945	147.7	147.2	147.2	140.5	141.9	151.2	135.4	143.7	142.1	142.4
1946	161.8	161.9	161.7	154.0	154.8	165.6	145.0	158.7	154.8	156.0
1947	196.6	195.1	194.6	177.7	180.3	202.4	165.7	189.0	179.3	179.4
1948	221.4	219.2	218.9	201.0	204.0	228.1	188.1	212.3	202.2	203.8
1949	213.8	215.6	215.0	208.1	208.4	218.4	195.5	211.9	208.7	211.4
ATLANTA AREA										
1926–29	82.7	87.0	84.2	83.7	87.0	82.9	94.5	84.7	87.5	86.8
1939	82.8	86.0	86.1	95.1	95.0	80.6	96.2	88.6	94.6	97.4
1945	133.9	132.1	132.5	123.3	127.0	135.9	120.7	130.1	123.3	122.8
1946	149.2	148.1	148.2	136.8	139.9	151.7	130.0	146.8	135.1	136.4
1947	184.0	180.4	181.4	158.1	164.6	187.5	150.1	174.9	158.0	157.1
1948	202.5	199.2	199.5	178.8	185.8	205.2	173.0	193.1	178.8	178.8
1949	189.9	189.3	189.3	180.6	185.4	191.7	172.7	186.5	177.5	180.8
BALTIMORE AREA										
1926–29	107.2	112.0	107.6	100.6	100.7	106.3	95.5	106.8	96.8	101.2
1939	93.5	95.5	95.6	99.3	99.2	94.0	101.7	96.6	101.4	100.2
1945	147.4	145.8	146.0	134.9	137.1	150.9	129.4	141.9	136.4	135.4
1946	163.1	161.7	162.2	149.1	150.8	167.6	138.9	158.8	150.0	148.2
1947	199.5	197.3	196.9	173.0	177.0	204.4	159.7	193.9	175.0	175.6
1948	221.5	219.5	219.8	196.0	199.7	227.0	181.7	215.6	197.1	199.0
1949	216.4	217.4	217.3	204.5	204.8	220.5	191.8	216.6	204.6	208.5
BIRMINGHAM AREA										
1926–29	91.7	96.7	94.1	95.5	96.8	90.2	97.5	94.6	96.3	96.3
1939	87.8	90.9	91.5	96.1	96.2	84.9	96.9	95.1	95.6	96.3
1945	135.2	135.1	135.7	127.1	121.1	136.2	120.8	133.5	126.2	127.7
1946	149.3	147.4	147.9	137.3	139.4	149.7	128.1	145.4	135.2	137.4
1947	175.3	174.2	174.1	154.9	159.5	182.6	146.1	167.7	153.7	155.7
1948	199.9	195.1	195.2	174.4	180.5	205.6	171.3	187.6	175.5	175.3
1949	188.2	187.2	187.6	178.9	182.0	192.8	172.6	183.7	177.7	180.0
BOSTON AREA										
1926–29	116.3	120.3	115.4	106.2	107.0	118.8	106.3	112.5	108.7	105.8
1939	106.2	110.4	110.1	116.3	113.7	105.7	114.2	111.5	118.2	118.5
1945	152.5	151.1	150.9	142.1	143.2	157.4	136.7	145.8	144.6	145.0
1946	167.0	166.5	166.0	156.8	156.6	172.1	147.1	161.1	158.5	160.4
1947	203.8	202.5	202.0	182.1	183.3	209.6	166.5	196.4	192.4	185.3
1948	227.5	226.2	225.6	205.3	207.7	234.7	190.0	218.8	207.1	209.7
1949	223.0	226.5	225.9	216.7	215.6	227.1	201.3	222.9	218.2	221.9
CHICAGO AREA										
1926–29	109.2	114.2	109.8	113.2	109.1	112.9	105.2	105.9	112.0	116.0
1939	110.6	112.5	111.1	123.6	118.7	114.2	117.6	109.3	122.6	127.6
1945	156.6	154.0	152.4	147.8	146.1	163.7	135.7	145.2	146.3	151.3
1946	168.3	166.0	164.2	158.9	156.9	168.1	144.5	157.4	157.0	162.5
1947	201.0	198.3	194.4	180.8	180.1	210.5	163.3	185.0	179.6	184.5
1948	224.5	219.9	217.5	201.7	202.0	235.8	183.2	206.4	201.1	205.9
1949	219.2	218.3	216.5	210.6	208.7	229.1	193.3	207.7	210.4	215.1
CINCINNATI AREA										
1926–29	100.5	105.0	101.3	101.0	100.2	100.2	99.6	103.1	100.6	101.0
1939	103.3	106.2	105.9	113.9	110.4	103.3	111.7	107.1	113.7	116.5
1945	151.2	152.1	152.1	142.7	142.8	153.1	132.8	151.7	142.9	145.2
1946	165.6	166.8	166.7	154.5	154.7	167.5	140.7	166.4	154.4	156.1
1947	199.8	199.7	199.4	177.5	179.6	203.9	162.5	196.4	179.6	180.1
1948	222.6	222.0	221.2	201.5	202.5	227.6	184.8	217.5	201.9	205.7
1949	214.1	216.6	215.8	207.5	206.0	217.9	193.5	214.1	208.4	212.2
CLEVELAND AREA										
1926–29	107.2	113.4	108.5	111.3	108.3	109.0	103.0	107.2	110.5	114.8
1939	106.2	109.6	109.5	115.3	112.8	107.5	112.9	109.5	117.7	118.0
1945	154.9	154.7	153.9	148.3	147.3	158.8	136.9	149.6	148.7	151.8
1946	169.2	169.4	168.7	160.2	159.9	174.1	146.4	164.3	161.0	165.9
1947	205.7	203.9	202.7	185.6	185.9	213.4	168.9	195.4	187.3	189.7
1948	229.8	228.2	226.4	209.4	208.7	238.7	190.5	219.6	210.9	214.5
1949	224.8	225.7	223.6	216.0	213.0	233.0	198.5	218.0	217.2	220.9
DALLAS AREA										
1926–29	103.1	107.3	103.2	98.9	99.1	103.6	100.5	100.9	99.4	99.7
1939	95.1	95.8	96.7	98.8	100.2	94.8	106.6	96.0	101.9	98.9
1945	135.8	134.5	134.9	127.4	131.0	138.2	129.3	130.1	130.8	127.9
1946	150.2	148.8	149.4	139.8	144.4	153.5	140.3	144.6	142.5	141.1
1947	188.2	185.4	183.5	165.8	170.4	194.5	162.8	175.5	167.4	162.6
1948	214.5	207.5	207.9	186.1	193.9	224.4	185.4	197.9	189.0	184.0
1949	207.2	206.2	206.9	197.1	201.3	210.3	197.1	203.2	201.5	195.4
DENVER AREA										
1926–29	95.0	99.7	95.5	102.4	99.6	95.5	105.5	94.6	101.4	108.0
1939	112.1	112.0	111.2	116.1	114.4	114.3	118.7	109.5	117.0	117.8
1945	147.6	146.7	147.1	141.1	145.2	152.4	145.8	142.2	147.8	144.4
1946	160.1	160.3	150.4	155.3	157.9	164.0	155.6	156.8	160.0	158.3
1947	194.2	194.7	194.9	180.9	184.0	197.9	176.6	192.0	185.6	183.1
1948	218.1	217.8	217.7	202.7	206.2	223.0	197.9	213.6	206.7	207.0
1949	212.9	215.8	215.9	211.0	213.1	216.2	207.0	214.3	214.6	215.3
DETROIT AREA										
1926–29	103.3	108.4	104.3	102.9	102.4	103.7	103.1	103.5	103.3	104.4
1939	98.8	102.7	102.9	108.6	107.5	98.7	108.8	104.2	111.4	110.1
1945	149.9	149.4	149.7	143.0	144.1	154.3	137.3	145.4	145.8	144.1
1946	165.9	165.9	165.8	157.4	157.9	171.3	147.5	160.9	160.0	159.7
1947	201.2	199.9	199.5	182.3	182.7	208.5	168.3	191.5	186.0	186.1
1948	224.7	223.4	223.0	203.8	205.1	231.5	187.9	215.9	206.5	207.2
1949	221.0	222.6	221.9	212.2	211.5	227.0	196.8	216.8	214.2	215.9
KANSAS CITY AREA										
1926–29	100.3	106.5	102.2	105.7	103.3	101.1	105.9	101.9	107.5	108.8
1939	104.4	109.9	109.8	118.3	115.4	103.8	117.2	113.0	120.0	121.6
1945	150.6	148.8	148.7	142.7	144.1	156.5	139.6	143.4	145.4	144.4
1946	166.5	165.6	165.4	158.2	159.5	172.3	151.0	159.8	159.3	160.3
1947	198.6	196.0	195.9	178.4	182.8	205.4	171.1	188.1	182.2	179.6
1948	227.6	224.3	224.4	203.9	209.0	235.9	195.5	214.9	208.2	206.2
1949	215.9	216.7	216.3	209.0	211.1	221.8	199.4	210.0	211.3	211.5
LOS ANGELES AREA										
1926–29	92.7	97.9	93.5	98.8	96.8	93.5	97.0	91.3	97.5	103.1
1939	93.6	97.2	97.5	103.7	105.0	95.6	109.5	96.8	106.2	104.9
1945	139.8	138.3	139.0	134.9	139.4	144.4	140.9	133.3	140.4	135.0
1946	155.1	156.1	156.2	155.3	156.7	160.1	158.3	150.9	160.0	158.7
1947	192.0	190.8	190.9	180.6	184.1	198.1	176.4	183.4	184.8	182.6
1948	216.5	215.9	215.7	205.8	209.5	223.0	199.7	208.2	209.8	210.0
1949	203.2	207.0	206.0	209.9	210.7	205.3	201.2	201.8	210.2	212.4
MINNEAPOLIS AREA										
1926–29	92.8	98.2	94.6	95.6	96.1	92.8	100.0	93.9	97.9	98.4
1939	101.9	105.0	104.2	113.5	110.7	102.7	113.4	103.6	114.5	117.2
1945	149.8	150.9	150.8	141.1	141.2	152.2	132.4	149.4	142.6	143.5
1946	163.7	167.6	167.5	156.5	155.7	164.9	142.6	168.2	157.2	159.5
1947	195.5	195.2	194.8	175.2	178.4	199.8	161.9	190.8	178.2	175.5
1948	223.3	222.1	221.6	200.8	203.9	229.0	186.2	214.9	201.5	204.9
1949	218.7	218.7	217.7	205.1	206.9	224.4	192.6	211.7	205.8	208.0
NEW ORLEANS AREA										
1926–29	93.3	96.3	93.4	86.5	90.6	93.3	93.7	91.5	89.5	86.5
1939	89.0	90.3	91.3	95.4	98.3	88.1	102.8	91.7	98.5	94.9
1945	136.4	134.4	134.5	127.7	131.6	139.1	131.1	130.5	131.6	128.4
1946	148.9	147.4	148.2	138.6	142.8	151.2	138.7	145.4	142.0	138.7
1947	161.9	178.7	179.2	159.2	166.7	186.2	156.4	174.1	162.7	157.4
1948	204.5	200.3	200.5	177.2	184.9	209.5	170.7	194.3	178.7	176.9
1949	201.6	201.4	202.0	188.8	194.6	204.9	186.0	200.0	191.8	189.8
NEW YORK CITY AREA										
1926–29	133.3	138.4	131.9	122.8	120.4	137.5	113.1	127.4	123.2	125.3
1939	122.1	123.3	122.5	130.6	125.9	125.6	123.7	119.6	130.0	133.3
1945	161.7	160.5	160.1	156.3	155.9	167.2	144.2	155.0	155.4	158.0
1946	182.4	181.8	181.1	177.2	174.6	188.1	158.6	177.4	174.8	179.0
1947	222.0	219.3	218.1	207.6	205.1	229.8	183.0	211.5	203.8	207.5
1948	251.6	250.1	249.0	239.4	236.8	260.5	212.2	240.7	236.5	242.2
1949	240.8	243.7	242.7	242.8	238.2	247.5	217.3	238.3	240.0	246.4
PHILADELPHIA AREA										
1926–29	100.3	106.3	103.7	105.9	103.1	98.1	101.9	104.2	104.1	107.5
1939	99.2	102.6	102.9	105.7	104.1	98.2	102.0	105.0	105.5	106.7
1945	152.1	151.1	151.9	141.9	143.7	155.3	131.8	147.8	141.3	142.7
1946	165.0	163.9	164.9	153.2	154.6	169.0	141.2	161.1	152.7	154.0
1947	201.9	198.6	198.6	176.7	179.8	206.7	161.2	192.3	175.8	176.9
1948	224.5	220.3	220.1	197.9	201.8	230.5	181.0	212.5	196.1	198.1
1949	220.5	220.6	220.3	209.0	209.0	224.3	190.3	216.3	205.6	209.9
PITTSBURGH AREA										
1926–29	113.3	118.8	112.8	111.2	107.1	115.4	89.6	112.2	104.6	112.9
1939	113.8	117.0	115.7	117.5	114.2	114.2	109.8	116.5	116.9	119.1
1945	157.6	159.9	155.9	146.1	145.0	161.4	130.3	153.2	143.7	148.0
1946	169.5	169.0	168.0	156.6	155.3	173.5	140.1	166.4	153.2	158.9
1947	204.3	200.6	199.5	180.4	180.8	211.5	160.4	194.0	178.0	181.4
1948	235.2	231.2	229.6	207.3	207.9	243.0	183.2	222.2	203.5	210.1
1949	227.1	229.1	227.7	215.6	212.2	231.3	186.9	227.0	209.8	219.8
ST. LOUIS AREA										
1926–29	118.6	121.1	115.7	109.9	108.8	121.3	103.3	111.7	107.7	109.3
1939	107.0	110.2	109.9	118.7	116.4	107.6	114.3	110.3	119.2	119.8
1945	152.3	152.8	151.4	146.2	146.4	156.2	135.9	148.1	145.6	148.5
1946	167.4	167.1	166.2	159.1	158.9	171.7	145.3	154.8	158.1	161.1
1947	203.8	202.4	200.8	183.9	185.6	209.6	167.0	194.9	184.0	184.2
1948	231.2	227.9	227.2	207.7	210.3	239.7	190.0	220.3	208.1	210.0
1949	220.7	221.4	220.7	212.8	212.4	226.8	197.5	217.3	213.6	215.7
SAN FRANCISCO AREA										
1926–29	87.7	93.7	90.4	97.5	96.5	86.1	95.5	91.8	95.9	99.0
1939	99.2	105.7	104.5	117.4	114.4	97.6	114.9	107.4	116.5	121.9
1945	144.3	146.2	146.8	144.5	146.1	147.2	141.9	145.3	147.9	146.8
1946	157.5	159.7	160.0	157.9	159.0	160.5	151.5	158.4	160.0	159.3
1947	191.6	193.1	193.0	183.7	186.1	196.1	174.8	189.3	186.9	186.8
1948	216.6	218.9	218.7	208.3	210.3	222.2	196.9	216.9	211.2	214.7
1949	207.1	213.0	212.8	214.0	213.9	210.0	203.9	213.9	216.1	219.8
SEATTLE AREA										
1926–29	84.5	92.2	89.2	101.7	95.1	82.4	100.8	92.2	100.5	105.9
1939	96.7	104.4	103.8	119.2	114.9	94.4	115.1	108.3	118.7	125.3
1945	143.7	148.6	148.2	151.7	150.5	143.6	147.0	148.7	154.5	156.8
1946	152.9	158.3	157.9	161.2	159.8	154.3	156.0	158.9	164.2	167.1
1947	188.1	193.1	192.9	188.5	188.8	182.3	177.3	193.1	192.2	193.1
1948	211.4	216.3	216.6	211.5	212.6	214.5	200.9	215.6	216.9	216.6
1949	203.9	214.2	214.0	220.7	218.1	205.2	209.9	218.0	225.3	228.5
WASHINGTON, D. C.										
1926–29	106.6	107.7	107.9	107.1	105.9	106.0	104.0	108.0	106.4	108.4
1945	153.4	150.3	151.9	144.4	145.9	157.8	135.9	146.5	144.6	143.5
1946	168.5	166.2	167.1	157.1	158.2	173.6	145.2	162.6	157.2	156.6
1947	204.2	200.0	200.0	178.9	182.9	210.3	166.9	193.7	181.0	178.1
1948	225.3	221.2	221.2	199.7	203.2	231.8	186.0	213.0	200.1	199.5
1949	223.1	223.3	223.1	213.5	212.6	227.2	194.8	218.6	210.4	214.6

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Current indexes are calculated upon an actual survey at source of local construction cost conditions. Material prices used are those paid by contractors to material dealers. Labor rates are current rates paid by contractors — certain corrections being made in certain areas for labor efficiency and labor shortage. Index includes construction overhead, sales taxes, compensation insurance and social security. The indexes have been primarily engineered to use as local cost conversion factors to construction cost data released by the Boeckh organization. Complete index formula is available in published form in "Boeckh's Index Calculator Tables."

Where Boeckh index is shown in these pages on charts with other building cost indexes, the average for all five Boeckh commercial and factory building indexes is used, converted to 1913=100.

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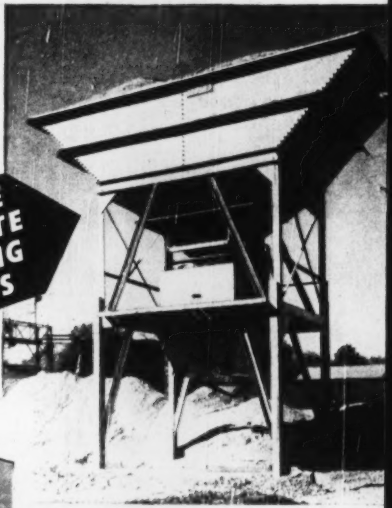
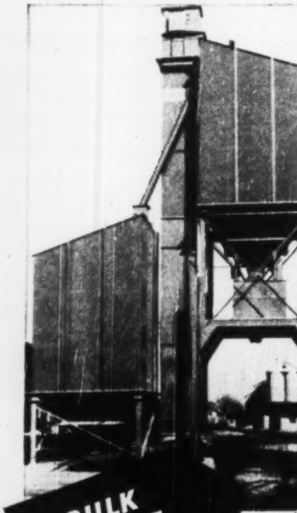
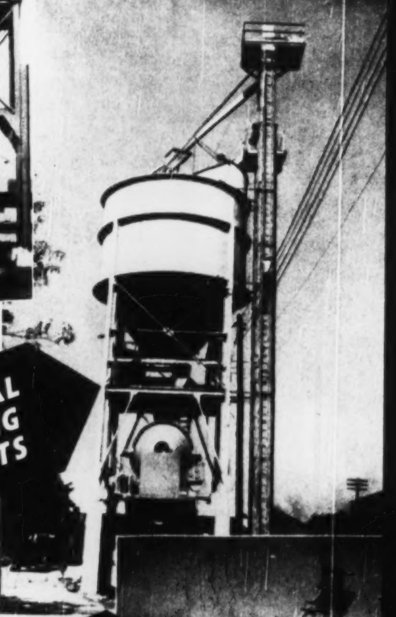
Capacities of aggregate plants range from 100 to 120 tons in two, three or four-compartment styles, bulk cement plants of 300 and 400 barrel sizes with combination arrangements to double these capacities.

The flexibility and portability of Blaw-Knox batching and mixing plants provide the solution to ready mixed concrete operations, central mixing plants or concrete products manufacturing problems. See your nearest Blaw-Knox distributor for details.


PORTABLE AGGREGATE BATCHING PLANTS


BULK CEMENT PLANTS


CENTRAL MIXING PLANTS

TRUCK MIXER LOADING PLANTS

SOUTH END BUILDING MATERIALS CO.

Hi-Boy Trukmixers

Clamshell Buckets

Concrete Buckets

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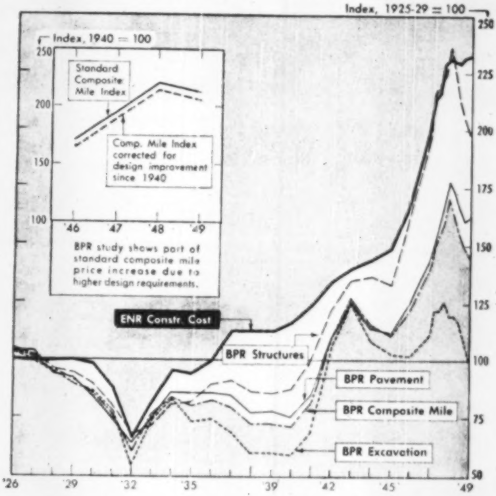
Price trends on highway construction for composite mile



Price Index—Composite Standard Mile

Year	Excavation[1] 17,491 cy* Bid price[3]	Excavation[1] Sub-index	Surfacing[2] 3,726 sy* Bid price[3]	Surfacing[2] Sub-index	Structures: Reinf. steel 16,000* lb. Bid price[3]	Structures: Struct. steel 4,325* lb. Bid price[3]	Structures: Struct. concr. 88* cy Bid price[3]	Structures: Comb. Sub-index	Composite mile Index
Base '25-29..	$0.35†	100.0	$2.22†	100.0	$0.052†	$0.067†	$22.15†	100.0	100.0
1926.....	.36	103.7	2.29	103.1	.053	.074	22.76	103.7	103.4
1932.....	.18	55.0	1.44	64.8	.034	.046	15.33	68.0	61.0
1939.....	21	59.8	1.73	77.8	.044	.059	19.13	85.9	72.6
1942.....	.37	105.5	2.44	109.7	.065	.090	26.16	122.3	109.9
1945.....	.36	102.6	2.48	111.8	.062	.077	31.62	132.5	111.7
1946.....	.36	101.9	2.78	125.3	.075	.113	38.79	164.7	122.9
1947.....	.39	111.2	3.20	144.2	.093	.132	45.84	196.9	140.4
1948.....	**.43**	**122.5**	**3.63**	**163.8**	**.108**	**.158**	**51.00**	**223.9**	**158.2**
1Q.....	.43	122.5	3.34	150.6	.100	.145	50.46	215.7	150.5
2Q.....	43	122.5	3.56	160.5	.106	.158	49.74	219.7	155.9
3Q.....	.44	125.4	3.71	167.3	.109	.159	50.89	224.6	161.0
4Q.....	.42	119.7	3.92	176.7	.116	.169	52.89	235.7	165.3
1949.....	**.39**	**111.2**	**3.67**	**165.3**	**.104**	**.146**	**47.36**	**210.3**	**152.7**
1Q.....	.42	119.7	3.83	172.7	.113	.167	49.04	223.6	161.4
2Q.....	.41	116.8	3.68	165.9	.105	.147	48.30	213.5	155.5
3Q.....	.38	108.6	3.56	160.4	.100	.136	47.21	205.8	148.7
4Q.....	.35	99.7	3.60	162.3	.098	.134	44.88	198.2	145.3

[1] Common excav. plus other excav. items expressed as equivalent common excav.
[2] Portland-cmt. concr. plus other surfacing expressed as equivalent portland-cmt. concr.
[3] Calculated to one more decimal place than shown in this table.
* Fixed quantities used for establishing composite mile for price trend.
† Prices used for establishing composite mile index base.

A steady drop in the price index for the U.S. Bureau of Public Roads standard composite mile during 1949 slowed down in the fourth quarter at 145.3, 12% below its peak in the 4th quarter of 1948. Structures were down 16%, surfacing was down 8% and excavation was 20% below its record high in the 3rd quarter of 1948.

This composite mile price index is based by the BPR on contractor's bids with 1925-29 averages used as the base of 100. Part of the increase since 1940 over earlier bid prices, around 3% of it, has been due to higher design requirements. To measure this increase an adjusted composite mile index, based on 1940=100 has been computed by BPR and is shown here on the insert graph on the main chart.

Highway price index based on California bids

California reports highway prices 17.5% lower in the fourth quarter of 1949 than those bid at their peak in the first half of 1948. The decline was fairly uniform during 1949, but the state's highway engineers, R. H. Wilson, H. C. McCarty and R. R. Norton, believe that the lower bids received in the last half of the year were largely due to the desire of many contractors to keep their organization and equipment busy during the winter months. When a larger volume of work is advertised this Spring it is expected that this factor will no longer be a major consideration and that bid prices will certainly level off and will probably increase.

This contractor competition was keenest on the larger jobs. On jobs of $500,000 and over in size, it increased from seven bidders in early 1948 to over 13% in the second half of 1949.

These trends are watched closely through the California highway construction price index shown in the accompanying tables and chart.

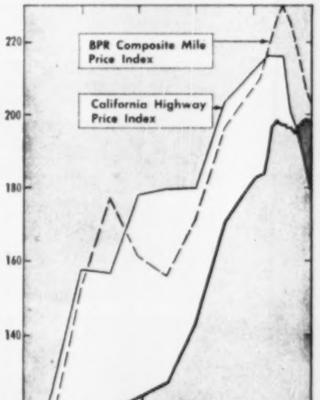
II—Quantities of contract items

Contract items (,000 omitted)		1948	1949
Roadway Excavation............	cy	15,697	15,352
Crusher Run Base..............	t	682	309
Plant-Mix Surfacing...........	t	1,501	1,453
Asphalt Concrete..............	t	34	15
Port Cmt Concr Pave...........	cy	209	258
Cl "A" Port Cmt Concr (Struct)	cy	164	140
Bar Reinforcing Steel.........	lb	27,305	23,712
Structural Steel..............	lb	36,414	17,692

I—Highway price index and average contract prices Division of Highways, State of California

Year	Roadway Excavation Per Cy	Crusher Run Base Per T	Plant Mix Surface Per T	Asphalt Concrete Pave. Per T	PCC Pavement Per Cy	PCC Structures Per Cy	Bar Reinf Steel Per Lb	Structural Steel Per Lb	Hwy. Constr. Price Index
1940*.....	$0.22	$1.54	$2.19	$2.97	$7.68	$18.33	$0.040	$0.083	100.0
1941*.....	0.26	2.31	2.84	3.18	7.54	23.31	0.053	0.107	125.0
1942*.....	0.35	2.81	4.02	4.16	9.62	29.48	0.073	0.103	157.5
1943*.....	0.42	2.26	3.71	4.76	11.48	31.76	0.059	0.080	158.4
1944*.....	0.50	2.45	4.10	4.50	10.46	31.99	0.054	0.132	177.8
1945*.....	0.51	2.42	4.20	4.88	10.90	37.20	0.059	0.102	179.5
'46, 1 Half**	0.41	2.31	4.00	4.54	9.85	37.38	0.060	0.099	186.1
'46, 2 Half**	0.39	2.27	4.12	5.04	12.39	49.84	0.079	0.142	193.2
'47, 1 Half**	0.48	2.62	4.52	6.46	12.41	47.03	0.080	0.133	202.5
'47, 2 Half*....	0.54	2.39	4.02	6.48	11.58	50.15	0.089	0.123	204.1
'48, 1 Half*....	0.56	2.45	4.42	4.91	13.37	49.51	0.094	0.145	216.8
'48, 2 Half*....	0.52	2.64	4.80	7.00	14.01	49.08	0.103	0.131	218.1
'49 1 Q*.....	0.49	2.48	4.54	5.70	11.84	48.11	0.089	0.113	200.4
'49 2 Q*.....	0.43	2.91	4.63	4.06	11.74	48.63	0.083	0.110	195.7
'49 3 Q*.....	0.41	2.40	5.05	4.60	11.53	45.35	0.080	0.093	187.9
'49 4 Q*.....	0.43	2.55	3.78	3.50	12.66	44.54	0.078	0.092	178.8

*All projects. **Federal-aid projects only.



CALIFORNIA'S highway construction price index is based on the average contract prices for the eight principal classes of construction shown in the accompanying table. The index is weighted each year according to the actual quantities of each of these contract items. The base is 1940 = 100, 1940 quantities multiplied by 1940 average contract prices. The price index for each period is computed by extending total quantities for period.

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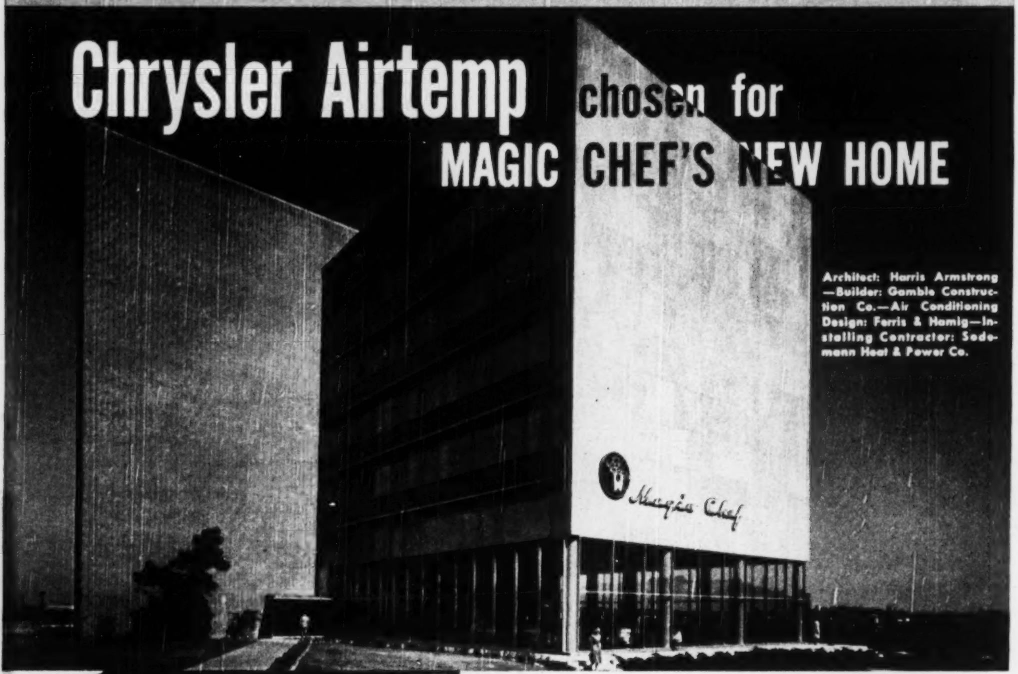

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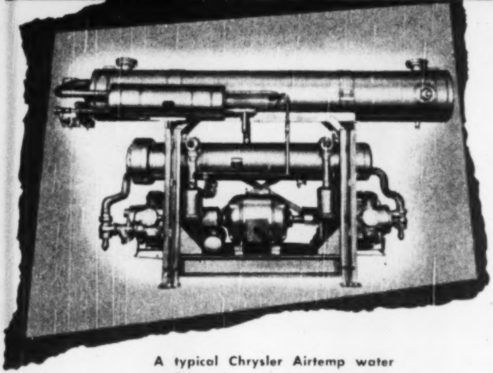

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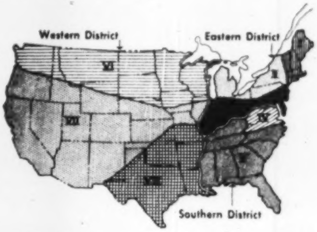
Railroad Cost Index

Railroad Construction Cost Indexes released August 1, 1949, by Engineering Section, Bureau of Valuation, Interstate Commerce Commission, include items developed from analysis of major construction contracts over a period of years. Indexes for material accounts are based on studies of carriers' returns to Valuation Order 14, joint studies made with various sub-committees of President's Conference Committee, well-known engineering and trade publications, contracts covering major construction projects and other information furnished by individual carriers.



Ratio of RR costs.	%
Road construction	73.09
Equipment, work	0.48
Equipment, rolling & floating	19.46
General	6.97
Total	100.00

RR—Road Construction Costs (1910-14=100)

By Districts & Regions		Per Cent	1926	1932	1939	1945	1947	1948
I to VIII		73.09	166	131	137	197	245	271
I	Eastern	75.36	173	134	140	206	263	288
II	Eastern	68.15	168	133	141	202	255	281
III	Eastern	67.99	168	132	144	205	259	285
IV	Southern	70.49	163	126	131	195	239	262
V	Southern	76.66	164	129	136	195	242	265
VI	Western	77.41	164	129	132	190	233	257
VII	Western	75.62	166	131	133	188	232	258
VIII	Western	78.15	167	133	140	198	242	270

Indexes represent territorial index factors and are not for determining unit reproduction costs for individual roads.

By Accounts	1926	1932	1939	1945	1947	1948
Engineering	166	131	137	197	245	271
Other Rt. of Way Exp.	159	121	135	201	238	261
Grading	153	106	90	144	154	159
Tunnels and Subways	178	119	140	236	304	337
Brdg., Culv. & Trestles	170	122	149	240	327	367
Elevated Structures	165	129	149	249	346	377
Ties	173	144	158	241	270	298
Rails	144	140	136	152	210	244
Other Track Material	177	163	167	176	217	266
Ballast	175	146	143	181	207	235
Trk. Laying & Surf.	188	164	165	273	336	366
Fences, Snw. Sheds, Sgns.	178	147	141	189	242	271
Stat. & Off. Bldgs.	184	141	166	244	333	364
Roadway Buildings	187	140	162	258	341	380
Water Stations	182	147	166	227	286	325
Fuel Stations	180	144	159	242	324	357
Shops & Eng. Houses	185	137	165	248	336	372
Grain Elevators	190	137	164	236	321	367
Storage Warehouses	189	137	166	253	340	369
Wharves & Docks	177	136	153	255	328	346
Coal & Ore Wharves	174	136	153	236	309	338
Tel. & Tel. Lines	157	121	129	173	239	251
Signals & Intrlocks.	169	130	143	176	212	219
Power Plants	186	138	167	246	354	375
Power Trnsmissn. Sys.	176	143	148	180	240	258
Misc. Structures	186	141	161	229	333	372
Roadway Machines	151	138	154	187	244	267
Roadway Small Tools	190	155	180	200	280	310
Public Impr. Const.	169	131	142	217	278	316
Shop Machinery	186	155	202	236	300	319
Power Plant Machnry	186	155	180	191	240	240
Work equipment	180	165	200	254	315	338

Public utility construction cost index

Compiled and published by Whitman, Requardt and Associates.

Individual series for 81 cost elements in three classes of utility construction, for five geographic divisions of the United States, are reported. Weighting is based on wide experience in cost analysis of plants and construction. Material prices from Engineering News-Record, Iron Age and various manufacturers; labor rates from utilities, unions and builders associations.

Cost trends of building construction—1911 to 1914 = 100

(Complete Index reports 13 items entering into Building Construction Costs.)
A relates to Reinforced Concrete Bldg.; B relates to Brick Bldg.

	Jan. '26	July '26	Jan. '32	July '32	Jan. '39	July '39	Jan. '42	July '42	Jan. '45	July '45	Jan. '46	July '46	Jan. '47	July '47	Jan. '48	July '48	Jan. '49	July '49	Jan. '50
Atlantic Seaboard Division																			
A	213	213	171	159	205	207	250	253	259	260	271	304	336	353	382	422	436	433	437
B	228	229	189	173	211	214	246	250	262	265	276	308	329	351	372	404	429	421	424
North Central Division																			
A	203	201	169	154	200	200	237	242	249	253	256	291	326	339	371	409	421	418	423
B	212	211	181	164	203	203	229	234	248	250	259	284	310	324	352	375	389	390	394
South Central Division																			
A	192	191	149	144	188	187	232	236	242	243	249	279	318	334	364	399	411	412	417
B	203	204	160	154	191	191	223	227	235	238	244	272	299	322	341	370	382	382	387
Plateau Division																			
A	198	197	153	149	194	194	230	235	238	239	248	278	307	327	349	385	402	397	400
B	211	210	167	163	199	200	221	227	231	233	257	286	309	331	349	378	396	395	396
Pacific Division																			
A	191	190	157	148	192	192	238	241	248	248	251	294	328	343	374	411	416	415	420
B	198	197	164	156	193	193	226	231	241	242	245	279	303	329	354	378	386	385	389

Cost trends of gas plant construction—1911 = 100

(Complete Index reports 17 items entering into Gas Plant Construction Costs.)
A relates to Total Constr. & Equip.; B relates to Mech. Equip. Exclusive of Gas Holders

	Jan. '26	July '26	Jan. '32	July '32	Jan. '39	July '39	Jan. '42	July '42	Jan. '45	July '45	Jan. '46	July '46	Jan. '47	July '47	Jan. '48	July '48	Jan. '49	July '49	Jan. '50
Atlantic Seaboard Division																			
A	230	230	202	188	241	249	272	275	283	288	302	334	366	398	413	446	469	464	467
B	212	212	209	195	274	278	297	299	296	301	301	369	387	395	403	424	447	481	479
North Central Division																			
A	217	218	198	178	232	232	249	254	264	269	272	308	335	367	384	417	435	434	437
B	212	212	209	195	274	278	297	299	296	301	301	369	387	395	403	424	447	481	479
South Central Division																			
A	199	200	171	160	216	217	244	249	258	261	266	298	335	359	379	404	420	419	425
B	212	212	209	195	274	278	297	299	296	301	301	369	387	395	403	424	447	487	479
Plateau Division																			
A	202	202	176	166	216	217	232	237	240	243	255	290	313	344	359	386	403	398	401
B	212	212	209	195	274	278	297	299	296	301	301	369	387	395	403	424	447	481	479
Pacific Division																			
A	205	206	187	177	227	228	253	257	264	266	271	315	342	369	387	416	433	428	433
B	212	212	209	195	274	278	297	299	296	301	301	369	387	395	403	424	447	481	479

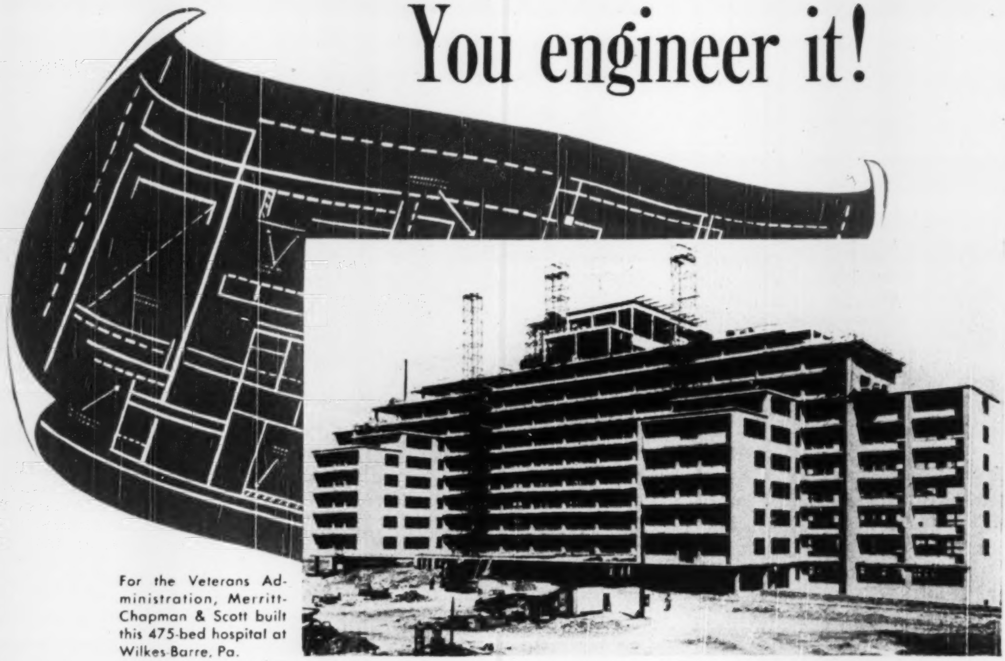
Cost trends of electric light and power construction—1911 = 100

(Complete Index reports 51 items entering into Electric Light and Power Construction Costs.)
A relates to Total Constr. & Equip.; B to Accessory Electric Equipment† C to Sub-sta. Equip.

	Jan. '26	July '26	Jan. '32	July '32	Jan. '39	July '39	Jan. '42	July '42	Jan. '45	July '45	Jan. '46	July '46	Jan. '47	July '47	Jan. '48	July '48	Jan. '49	July '49	Jan. '50
Atlantic Division																			
A	197	194	182	176	224	225	248	248	251	259	266	303	327	351	357	377	401	400	399
B	197	196	192	186	225	224	241	239	226	237	248	278	308	323	323	333	340	341	341
C	184	178	172	168	203	203	217	216	207	218	228	252	273	288	288	296	306	312	312
North Central Division																			
A	190	187	186	174	219	218	235	238	238	243	245	280	299	324	333	351	375	374	374
B	189	188	199	186	224	223	229	231	216	218	222	249	272	289	292	300	309	307	310
C	178	171	181	169	203	202	207	209	198	200	204	225	240	257	260	264	278	280	283
South Central Division																			
A	184	183	179	171	218	218	245	246	248	251	251	288	310	336	344	365	391	390	390
B	187	189	200	190	231	230	250	248	235	235	235	267	290	311	314	326	341	340	340
C	175	171	181	173	210	209	226	226	217	217	217	243	257	278	281	290	310	311	311
Plateau Division																			
A	190	188	177	171	218	219	234	236	238	241	244	282	300	329	334	355	378	378	376
B	197	196	194	188	231	232	237	236	225	225	225	259	279	302	303	315	322	323	323
C	185	177	175	171	209	211	213	212	207	207	207	234	246	269	269	278	289	294	294
Pacific Division																			
A	180	178	172	163	216	215	235	242	242	244	244	283	300	332	339	359	383	380	379
B	178	177	182	170	222	222	231	240	225	225	225	256	275	303	303	317	328	323	323
C	167	161	164	155	203	202	210	219	208	208	208	234	244	272	273	284	298	297	297

†Formerly called "Electric Plant-Steam."

You engineer it!



For the Veterans Administration, Merritt-Chapman & Scott built this 475-bed hospital at Wilkes-Barre, Pa.

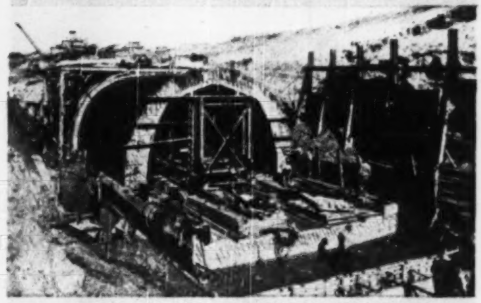
MERRITT-CHAPMAN & SCOTT

will build it speedily, economically!

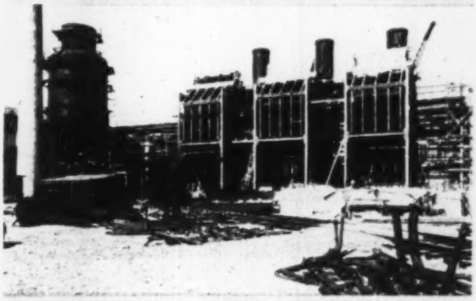
In completing hundreds of construction projects — industrial plants, large scale housing, hospitals, schools, bridges, tunnels — Merritt-Chapman & Scott has earned a nation-wide reputation for accomplishment. M-C & S brings to each job, ***large or small,*** an organization with extensive knowledge in every building field . . . specialized facilities that assure economy, efficiency and speed . . . ingenuity that makes the most of knowledge and resources. You can depend on Merritt-Chapman & Scott to solve your construction problems.

Founded in 1860 . . . now in our 90th year

For Merck & Company, M-C & S built a streptomycin plant at Elkton, Va., and simultaneously constructed this processing and packaging plant at Rahway, N. J.

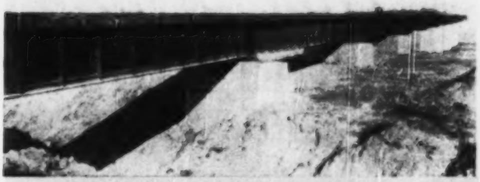


For the Port of Houston, Merritt-Chapman & Scott served as General Contractors in the building of the Washburn Tunnel at Pasadena, Texas.

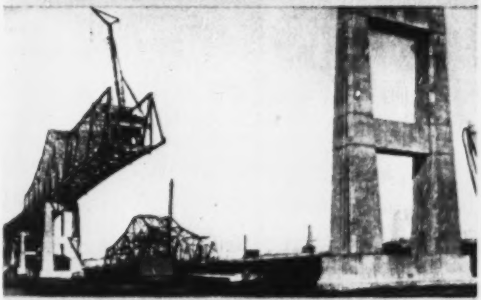


For The Texas Company, Merritt-Chapman & Scott built this new outdoor boiler plant for large oil refinery at Port Arthur, Texas.

For the Hudson Pulp & Paper Company, Merritt-Chapman & Scott constructed all buildings, purchased and installed equipment in this new plant at Palatka, Fla.



For the Union Pacific Railroad, Merritt-Chapman & Scott constructed 6 grade separation structures and this 11-span bridge at Long Beach, Calif.



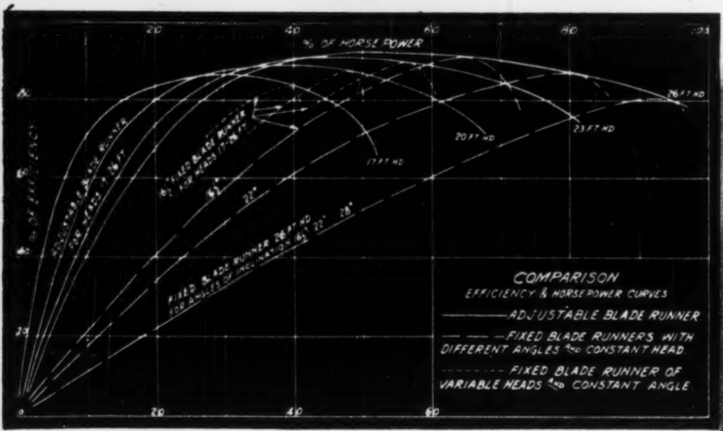
For the Mystic River Bridge Authority, Merritt-Chapman & Scott built these deep water piers to support New England's largest sky highway at Boston, Mass.

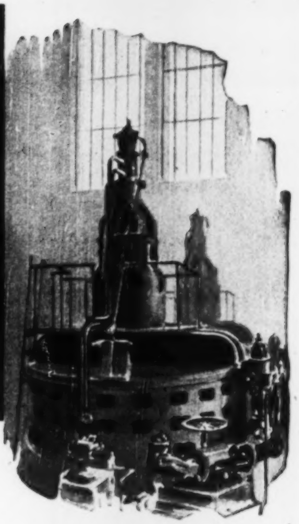
Your Confidence is Justified Where This Flag Flies

MERRITT-CHAPMAN & SCOTT
CORPORATION

GENERAL OFFICES:
17 Battery Place, New York 4, N. Y.

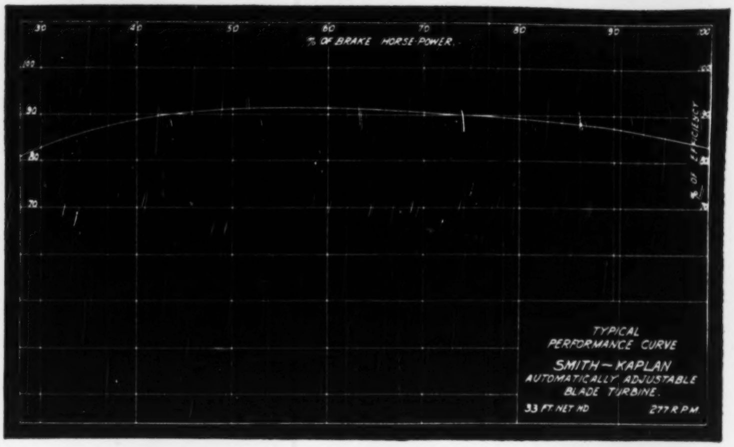
BOSTON · CLEVELAND · NEW LONDON · PASADENA, TEXAS





"Actions Speak Louder than Words"

The SMITH-KAPLAN Turbine



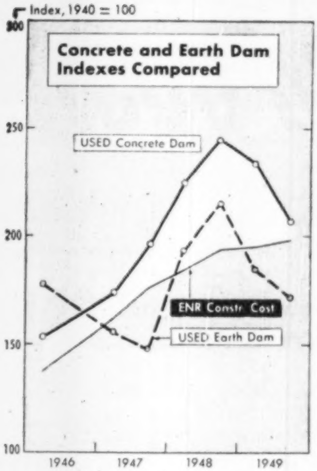
If It's Hydraulics—Put It Up to Us!

EXAMINE the Charts, closely. Note performance!

The most marked advantages of the Smith-Kaplan Turbine are its ability to maintain high efficiency over a wide range of load, and to provide a high output under reduced head conditions. And these superiorities are even more pronounced when considered with its high specific speed which allows use of higher speed generators, resulting in marked economy of overall installation and lower costs of smaller power house! Send for Bulletin.

S·MORGAN SMITH COMPANY
YORK·PENNSYLVANIA~U·S·A·

POWER *by* SMITH



Concrete dam price index — 1940 = 100 U. S. Corps of Engineers

Items (70% of tot)		Quantity#	1940 Unit Price	'40	'46I	'47I	'47II	'48I	'48II	'49I	'49II	'49II Unit Price
				Cost in $ thousands (,000 omitted)								
Common Excav	cy	*230	0.318	73	114	101	84	137	150	116	116	0.505
Rock Excav	cy	180	1.500	270	369	448	513	592	668	499	486	2.700
Borrow Excav	cy	55	0.310	17	34	21	20	25	27	23	23	0.423
Embank (plac)	cy	170	0.120	20	35	30	22	32	44	37	30	0.175
Concr, Mass-Cl VI	cy	500	5.400	2,700	4,300	4,775	5,500	6,450	6,860	6,700	5,800	11.600
Concr, Cl IV	cy	47	7.200	338	602	724	785	846	964	1,006	855	18.200
Concr, Cl II	cy	13	9.000	117	166	237	263	280	429	350	289	22.200
Cement	bbl	560	1.980	1,109	1,378	1,529	1,663	1,803	2,111	2,279	1,910	3.410
Reinf Steel	lb	3,000	0.43	129	234	255	285	327	360	354	309	0.103
Struct Steel	lb	2,000	0.09	180	336	516	580	538	500	414	460	0.230
USED Concrete Dam Price Index				100	153	174	196	223	245	237	207	

Earth dam price index — 1940 = 100 U. S. Corps of Engineers

Items (70% of tot)		Quantity#	1940 Unit Price	'40	'46I	'47I	'47II	'48I	'48II	'49I	'49II	'49II Unit Price
				Cost in $ thousands (,000 omitted)								
Common Excav	cy	**1,400	.279	391	602	529	444	718	788	612	612	0.437
Rock Excav	cy	60	1.580	95	130	157	179	208	215	175	170	2.840
Borrow Excav	cy	3,500	.220	770	1,582	963	917	1,141	1,253	1,061	1,061	0.303
Embank (Plac)	cy	3,400	.064	218	398	340	231	360	503	340	340	0.100
Concr. Cl IV	cy	35	7.600	266	473	564	613	662	753	788	672	19.200
Concr. Cl II	cy	8, 3	10.800	90	123	176	205	204	312	257	212	25.600
Cement	bbl	52	2.350	122	153	170	193	200	233	252	212	4.080
Reinf. Steel	lb	2,500	.043	108	195	213	240	275	303	298	260	0.104
Struct Steel	lb	200	.100	20	38	58	65	60	56	46	51	0.256
USED Earth Dam Price Index				100	178	153	148	183	213	185	173	

I First half of year. II Second half. # Thousands (,000 omitted). * Common excavation quantities increased 45% over those used last year. ** Common excavation quantities increased 115% over those used last year. These increases change the dam index values reported in ENR Mar. 17, 1949, p. 199, to those shown in the accompanying table and chart.

Concrete and earth dam price indexes

Low bids for construction of concrete dams were down almost 19% in the second half of 1949 compared with peak prices of 1948. Earth dams were going under contract at 15% less than their record highs.

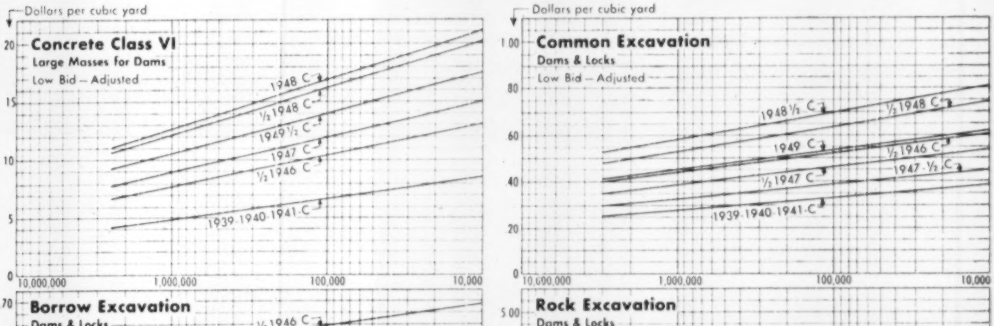
These savings to federal taxpayers are measured by the dam prices indexes computed by the U. S. Corps of Engineers, Engineering Department, based on 10 contract items for concrete dams and 9 for earth dams. In both cases the items selected represent 70% of the total contract.

USED indexes are based on quantities and price experience in 1940 as 100. The second half of 1948 saw the highest bids on record with an index of 245 for concrete dams. This came down to 207 in the second half of 1949. Earth dam bids set a record high of 213 in 1948 which is down to 173 in 1949.

A second set of tools developed by the Corps of Engineers for cost estimating is shown here. These tools are the unit price charts which measure price trends by quantities to be handled as well as by years.

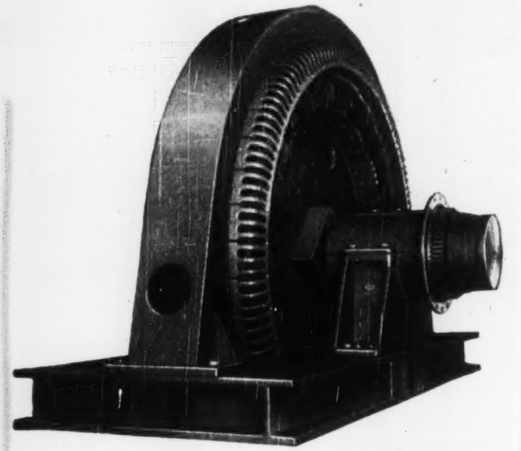
USED dam price indexes and unit price charts are the result of studies by the Project Planning Branch, Engineering Division of Civil Works, Office, Chief of Engineers, under direct supervision of G. A. Wallace, Chief of Branch, and under general supervision of R. W. Stuck, Chief of the Division.

UNIT PRICE CHARTS BY QUANTITIES AND YEARS



Save on original costs

use G-E synchronous

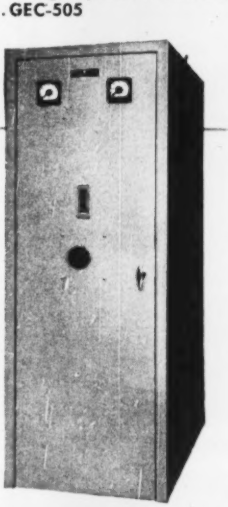


You'll save money in many applications when you specify General Electric synchronous motors. The chart shows (ratings above the black line) the applications where synchronous motors (including control and exciter) have a lower first cost than any other kind of motor. And even in cases where there is no original saving (between red and black lines) you can save on over-all cost by specifying synchronous motors to increase operating efficiency and improve power factor.

When you specify G-E synchronous motors, you get application engineering by experts in the electrical problems of *your* industry. You get the motor that gives you greatest return on your investment.

For your next large, constant-speed motor, ask your General Electric sales representative to tell you how you can take full advantage of the money-saving features of G-E synchronous motors. Or write for bulletins on your letterhead to *Section 770-17, Apparatus Dept., General Electric Co., Schenectady 5, N.Y.*

Low speed . . GEA-5332 **High speed . . GEA-5426**
Control . . GEC-505



PROTECT YOUR SAVINGS WITH G-E SYNCHRONOUS MOTOR CONTROL

New rotor field circuit provides accurate field application—motor is protected against starting shock.

New rotor field circuit keeps constant check on motor performance and, on pull-out, field is removed before first slip cycle is completed—to protect against electrical and mechanical damage.

In addition to the protection offered by the new rotor field circuit, the **new, smaller air-break Limitamp controller** provides fast-acting EJ-2 Fuses that limit short circuits to less than one-half cycle for motors up to 5000 volts.

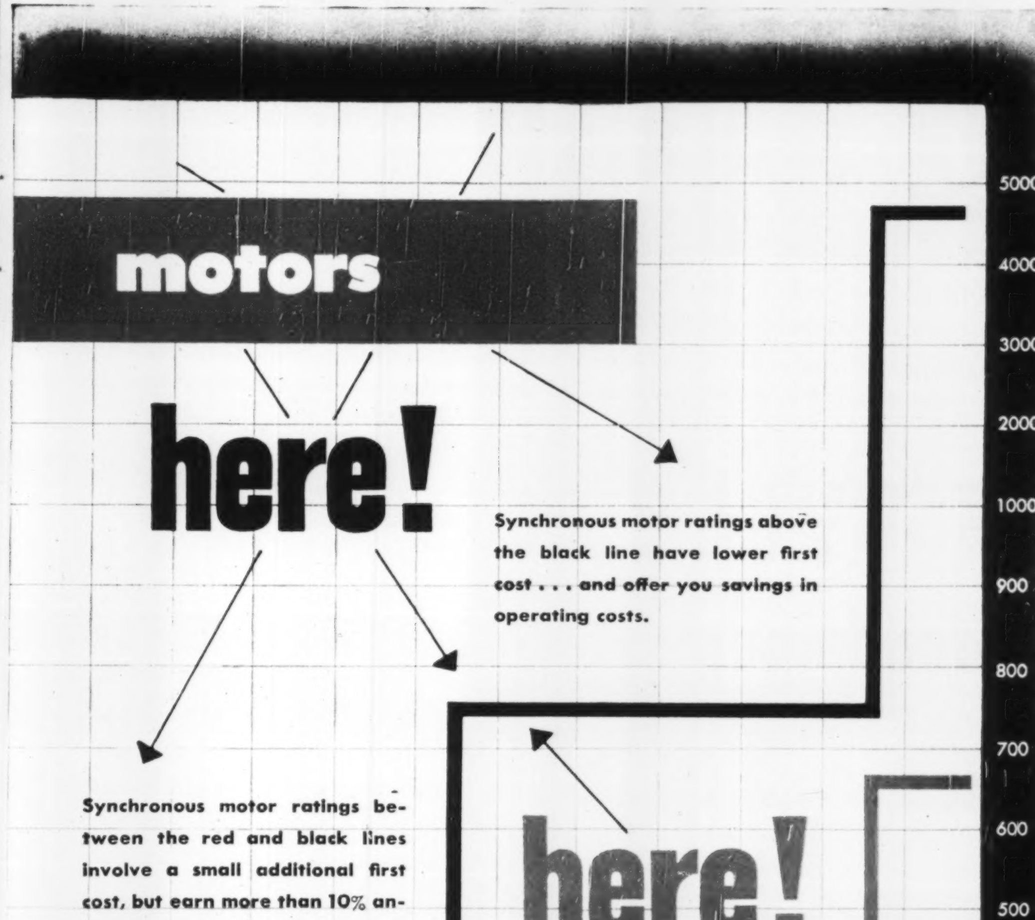
Low-voltage motors (up to 600 volts) are protected by compact, easily inspected air-circuit breakers.

To make it easier to install, to adjust, to operate, and to service, G-E synchronous control is factory-mounted in a steel enclosure with anti-glare meters and all the built-in accessories required for your application.

Come to General Electric for the engineering and manufacturing that will assure you of adequate protection of your motor and plant investment. Write for more information on this precise motor control.

GENERAL ELECTRIC

770-17



motors

here!

Synchronous motor ratings above the black line have lower first cost . . . and offer you savings in operating costs.

here!

Synchronous motor ratings between the red and black lines involve a small additional first cost, but earn more than 10% annually in reduced operating cost. Be sure to consider these savings on all ratings.

FOR ECONOMICAL

Water Storage

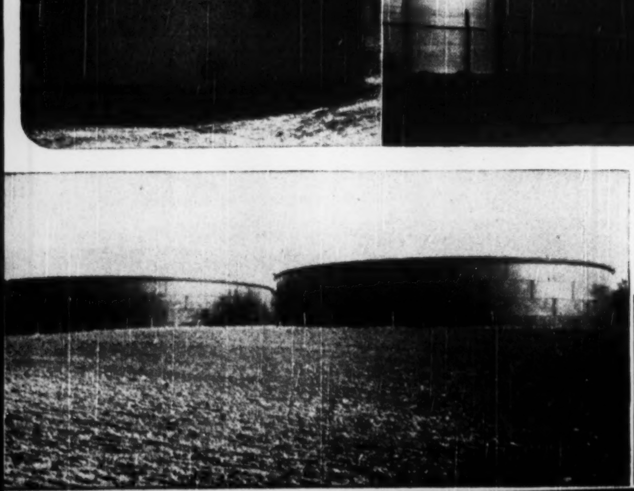
AT NATURAL ELEVATIONS

PITTSBURGH·DES MOINES

Standpipes

and

Reservoirs



Sound, enduring performance, based on correct engineering, dependable fabrication and careful erection, assures complete satisfaction with Pittsburgh-Des Moines Steel Standpipes and Reservoirs.

Over the years, their first-cost economy, low maintenance, and continued freedom from deterioration make these units an ideal water storage investment. *Write!*

PITTSBURGH • DES MOINES STEEL CO.

Plants at PITTSBURGH, DES MOINES *and* SANTA CLARA

Sales Offices at:

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NEW YORK . . . Room 916, 270 Broadway
CHICAGO, 1218 First National Bank Bldg.
DES MOINES . 915 Tuttle Street
DALLAS . 1219 Praetorian Bldg.
SEATTLE . . . . 922 Lane Street
SANTA CLARA, CAL. . 621 Alviso Road

Construction materials prices in 20 cities

Market quotations on construction materials reported monthly by ENR correspondents

	CEMENT, Bulk, per bbl. CL lots. Incl Dealer Comn. fob city			SAND, per ton Truck lots or over fob city			CONCRETE, READY MIXED 1:2:4, over 50 cy. per cy, delivered			BRICK, Clay Backing 3 x 4 x 8¼ in per M, CL lots fob city			STRUCTURAL CLAY TILE Partition, Scored, 3 x 12 x 12 per M 2000 pieces or over delivered		
	1949		1950	1949		1950	1949		1950	1949		1950	1949		1950
	Low	High-Dec.	Feb.	Low	High-Dec.	Feb.	Low	High-Dec.	Feb.	Low	High-Dec.	Feb.	Low	High-Dec.	Feb.
Average	**2.94**	**2.99**[a]	**2.96**	**1.95**	**2.01**[a]	**1.96**	**10.18**	**10.35**	**10.39**	**27.44**	**27.76**	**27.91**	**131.08**	**131.98**[z]	......
Atlanta	3.05	3.10	3.10	1.75	1.75	1.75	11.00	11.00	11.00	25.00	25.00	25.00	......	......	......
Baltimore	3.00	3.14	3.14	1.95*	1.95*	1.95*	9.85	10.25	10.25	32.00*	32.00*	32.00*	170.00	175.00	175.00
Birmingham	2.74	2.74	2.68	1.66	1.84	1.84	7.75	7.75	7.75	20.00	20.00	20.00	97.50	97.50	97.50
Boston	3.31	3.46[a]	3.41	2.50#	2.50#	2.50#	10.45[l]	10.50[lk]	10.45[l]	32.00	32.00	32.00	140.00†	145.65[A]†	140.00†
Chicago	2.59	2.61	2.61	3.20*#	3.20*#	3.20*#	.....	.....	.....	21.00*[u]	21.00*[u]	21.00*[u]	115.00	115.00	115.00
Cincinnati	2.94	3.08	3.08	1.75*	1.75*	1.85*	10.40[o]	10.60[l]	11.65[l]	32.50	34.00[v]	32.25	168.00	170.00[B]	170.00
Cleveland	2.73	2.90[a]	2.75	1.55††	1.55††	1.55	11.80[m]	11.80[m]	11.80[m]	28.50*	28.50*	28.50*	118.00	118.00	118.00
Dallas	2.52	2.52	2.52	1.75	1.75	1.75	9.15	9.30[n]	9.30	18.75	18.75	18.75	......	......	......
Denver	3.29	3.29	3.29	1.15	1.15	1.15	9.65	9.65	9.65	32.00	32.00	32.00	......	......	......
Detroit	2.73	2.97[b]	2.73	2.70*#	3.25*#	3.00*#	9.15	9.65	9.85	30.00	30.00	31.50	117.08	117.08	Not Mf'd.
Kansas City	2.85	2.99[c]	2.85	1.30*	1.65*[f]	1.30*	10.40[o]	10.65[op]	10.40[o]	16.00	22.63[w]	22.63	115.00	115.50	115.00
Los Angeles	3.32	3.42[d]	3.32	1.72*	1.74*	1.74*	9.70[r]	10.78[rq]	9.70[r]	20.00	20.00	20.00	—	Not Used	—
Minneapolis	3.00§	3.07§	3.07§	1.35*[g]	1.35*[g]	1.45*[g]	10.30[t]	10.90[t]	10.90[t]	30.00	30.00	30.00	152.00	158.00	158.00
New Orleans	2.65	2.75[d]	2.65	1.82	1.82	1.82	10.65	12.40	12.40	29.00	29.00	29.00	160.00	160.00	160.00
New York	3.15	3.24	3.24	1.45#**	1.45#**	1.45#**	9.95††	10.50††	10.50††	33.00	33.00	33.00	112.20	118.20	118.20
Philadelphia	3.02	3.14[e]	3.02	2.05*	2.05*	2.05*	9.85	10.80	10.80	27.00	27.00	27.00	112.10	126.30	126.30
Pittsburgh	2.85	3.10[c]	2.85	2.00*	3.00*[h]	2.00*	10.35	11.50[s]	10.85	26.00	26.00	26.00	98.00	98.50[C]	98.00
St. Louis	2.75	2.75	2.75	2.20*[i]	2.20*[i]	2.20*[i]	10.40	10.40	10.40	32.50	32.50	32.50	120.00	120.00	120.00
San Francisco	2.98	2.99	2.99	1.94	1.94	1.96	10.75[u]	10.75[u]	10.15[u]	30.00	32.00[y]	33.00[y]	132.00	132.00	132.00
Seattle	2.95	3.05	3.05	2.75*[j]#	2.75*[j]#	2.75*[j]#	9.75[x]	9.75[x]	9.75[x]	32.00	32.00	32.00	150.00	150.00	150.00
Montreal	2.24	2.31	2.31	....	....	2.00[S]	8.95#[S]	9.05#[S]	9.05#[S]	25.50	25.50	25.50	110.00‡	115.00‡	115.00‡

§ CL price from Cement Co. Dealers sell only LCL. * Delivered. # Per cu. yd. † Fob yard. †† Fob plant. ‡ Provincial & municipal tax extra. ** Barge lots asd. [S] Sales tax incl. [a] Dec. 0.04 less. [b] Dec. 2.73. [c] Dec. 2.85. [d] Dec. 0.10 less. [e] Dec. 3.02. [f] Dec. 1.30. [g] 5% cash dis. [h] Dec. 2.00. [i] 2% cash dis. [j] 50¢ cash dis. [k] Dec. 10.45. [l] up to 500 cu yds. [m] 7–9 mi zone. [n] Dec. 9.15. [o] 25 cu yds plus. [p] Dec. 10.40. [q] Dec. 9.70. [r] 1:2¼:4. [s] Dec. 10.85. [t] 10–100 cu yds. [u] 3¼:4:8¼. [v] Dec. 32.50. [w] Dec. 22.00. [x] 2¼:4.8¼. [y] 2,000 lb. [z] Dec. 131.76. [A] Dec. 140.00. [B] Dec. 168.00. [C] Dec. 0.50 less.

LUMBER, No. 2 Common or better, 2 x 4 s4s

	Short Leaf Yellow Pine				Douglas Fir			
	1949			1950	1949			1950
	Jan.-Hi	Low	Dec.	Feb.	Jan.-Hi	Low	Dec.	Feb.
Average	**83.08**	**72.95**	**75.23**	**74.65**	**94.63**	**84.89**	**85.03**	**84.44**
Atlanta	60.00†	60.00†	60.00†	60.00†	......	......	......	......
Baltimore	92.00	60.00	60.00	60.00	115.00	76.00	76.00	76.00
Birmingham	73.00†	63.00†	63.00†	63.00†	77.00†	65.00†	65.00†	65.00†
Boston	85.00[b]	82.00[b]	91.00[b]	91.00[b]	92.00	90.00	94.00	94.00
Chicago	80.00*	71.00*	73.00*	73.00*	86.00*	81.00*	83.50*	83.50*
Cincinnati	105.00	83.00	83.00	80.00	......	90.00	95.00	83.00
Cleveland	73.00	63.00	68.75	66.75	......	......	......	......
Dallas	61.00†	58.00†	60.00†	60.00†	......	......	......	......
Denver	......	......	......	......	110.00	86.00	86.00	86.00
Detroit	79.00	61.00	68.50	65.00	91.75	75.00	82.00	85.00
Kansas City	101.50[a]	90.00[a]	90.00[a]	90.00[a]	106.50[a]	89.75[a]	90.00[a]	90.00[a]
Los Angeles	......	......	......	......	82.00[c]	68.00[c]	72.00[c]	71.00[c]
Minneapolis	......	......	......	......	111.00*[b]	100.00*[b]	100.00*[b]	100.00*[b]
New Orleans	70.00†	70.00†	70.00†	70.00†	71.00†	71.00†	71.00†	71.00†
New York	85.00*	77.50*	85.00*	85.00*	101.25*	91.25*	95.00*	95.00*
Philadelphia	99.75	92.50	92.50	92.50	115.00	110.00	110.00	110.00
Pittsburgh	82.50†	77.50†	77.50†	77.50†	105.00†	90.00†	95.00†	95.00†
St. Louis	99.50*	86.25*	86.25*	86.00*	120.00[d]	100.50[d]	100.50[d]	101.50[d]
San Francisco	......	......	......	......	68.00†	68.00†	68.00†	67.00†
Seattle	......	......	......	......	62.50†	62.50†	62.50†	62.50†
Montreal	75.00[ef]	70.00[ef]	70.00[ef]	70.00[ef]	155.00[f]	140.00[f]	140.00[f]	140.00[f]

† Fob mill. * Delivered. [a] Retail LCL. [b] Norway pine. [c] Yard. [d] Delivered LCL lots. [e] Spruce. [f] Tax exempt.

Building materials prices

Average yearly prices at New York, except steel and cast iron pipe

Year	Brick Common per M	Cement per bbl.	Lime per bbl.	Pine per M ft BM	Steel Shapes per cwt.	Cast Iron Pipe per ton
1874	$7.41	$1.48R	$1.50a	$26.00d	....	$43.76h
1870	6.65	2.25R	.95a	21.75d	....	24.65h
1907	6.16	1.55	.95a	30.50d	1.75	31.52i
1913	6.75	1.18	.915a	25.04e	1.50	21.96i
1929	11.71	2.23	2.25b	64.50f	1.92	36.66i
1932	9.75	1.62	2.25b	39.91f	1.56	30.58i
1938	13.10	2.12	2.80b	59.33f	2.18	48.33i
1939	13.46	2.20	2.80b	64.35f	2.10	46.75i
1942	14.17	2.20	2.80b	85.61f	2.10	49.00i
1947	26.38	3.46	24.34c	115.83g	2.61	75.46i
1948	30.33	4.05	26.32c	114.38g	2.98	89.58i
1949	33.00	4.23	26.80c	98.13g	3.25	91.50i

BRICK: wholesale, fob; CEMENT: net, delivered *R* Rosendale, rest Portland; LIME: *a* common lump, wholesale, fob, 180 lb., net, *b* 280 lb., *c* common hydrated, delivered, per ton (40 bags of 50 lb. ea) no longer quoted per per bbl.; LUMBER: No. 1 common, rough, *d* 1-in. yellow pine, wholesale at dock, *e* 3-in. LLYP, *f* 3 x 12 LLYP from Lumber Trade Jl., *g* 3 x 12 SLYP (LLYP out of market); STEEL: fob Pittsburgh; CAST IRON PIPE: fob Delaware River foundries, *h* all classes bell and spigot, *i* 6-in. and larger, Cl B or heavier bell and spigot.

Index wholesale price US Bu. of Labor Statistics

Building materials

	1926 = 100						
Components	**1929**	**1932**	**1939**	**1946**	**1947**	**1948**	**1949**
All	**95.4**	**71.4**	**90.5**	**132.2**	**179.7**	**198.6**	**193.3**
Brick and tile	94.3	77.3	91.4	123.0	139.6	155.7	161.7
Cement	91.8	77.2	91.3	104.1	115.5	130.4	133.8
Lumber	93.8	58.5	93.2	177.5	276.0	311.2	286.0
Paint	94.9	71.1	82.8	118.3	165.5	159.6	151.1
Plumb & heat.	95.0	66.8	79.2	103.5	125.4	147.6	154.8
Struc. steel	98.1	80.9	107.3	118.5	134.3	163.7	179.3
Other	97.7	79.5	90.3	117.9	147.1	167.6	171.7

BLS, late in 1948, launched a new weekly wholesale price index covering building material predominant in housing cost. This has fewer components than the monthly index reported above but agrees on trend.

Canadian price index Dominion Bu. of Statistics

Building materials

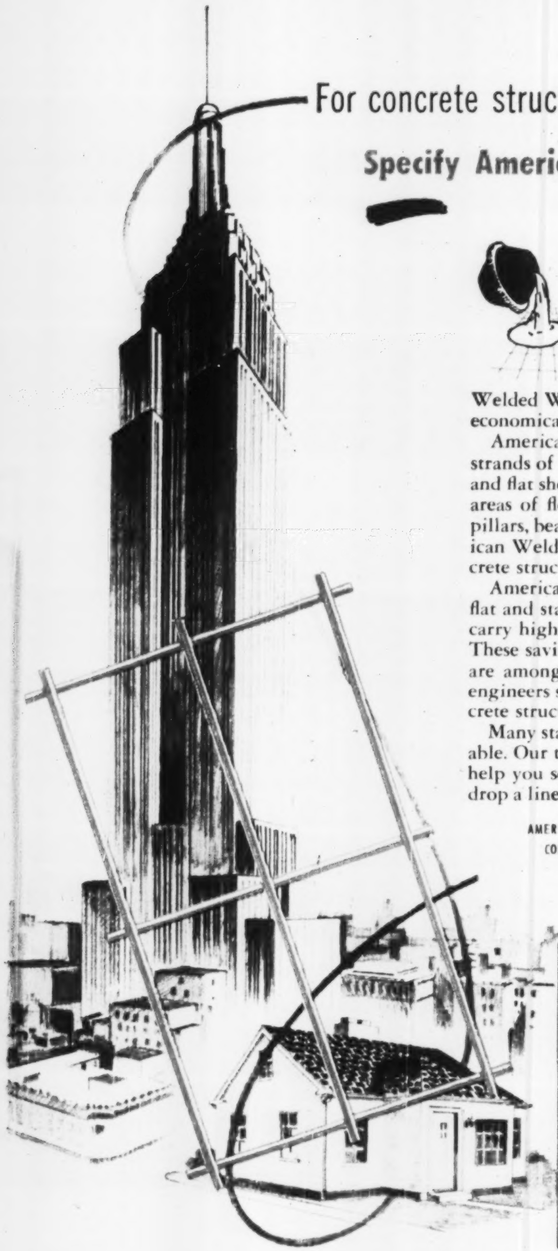
	1935–39 = 100						
Components	**1929**	**1932**	**1939**	**1946**	**1947**	**1948**	**1949**
Composite	**112.4**	**87.5**	**102.3**	**154.5**	**180.4**	**217.5**	**228.0**
Cmt, snd, grav.	107.6	103.7	94.0	102.0	109.7	122.3	126.9
Br, tile, stone	107.4	101.8	97.2	121.0	133.4	143.1	150.9
Lumber&prod.	116.7	72.7	104.9	202.1	242.0	305.8	322.2
Lath, insl.	94.4	85.0	99.4	104.2	107.3	116.7	118.3
Roofing	108.8	95.5	104.1	146.2	172.3	201.6	190.5
Paint, glass	151.5	111.7	97.2	144.2	169.6	183.1	179.6
Plmb, heat eq.	108.5	108.1	103.0	127.2	145.2	168.3	180.2
Elect eq, fixt.	130.1	79.1	102.4	116.9	147.4	169.8	172.6
Other mat'ls.	106.1	89.5	104.6	126.4	143.0	162.3	174.9

Wholesale prices of building materials dropped 23% in Canada in 1949, but were still 121% above 1949.

Mexico City, Mex., prices

In pesos, f o b city	Per	Dec. '48	Dec. '49
Struct. Steel Shapes			
3"–15" x 12 meters	ton	1,300.00	1,050.00
Reinforced Steel, Corr. Rods			
3/8" x 12 meters	ton	1,140.00	1,075.25*
1/2" x 12 meters	ton	1,080.00	1,065.25*
5/8" x 12 meters	ton	1,056.00	1,055.25*
3/4" x 12 meters	ton	1,020.00	1,045.25*
7/8" x 12 meters	ton	1,020.00	1,045.25*
1" x 12 meters	ton	1,020.00	1,045.25*
Gravel, truck load of 3½ cu. meters			
Blue Gravel	tr. load	30.00	32.00
Rose Gravel	tr. load	32.00	30.00
Cement, Std. Port.†	ton	115.00	115.00
Lumber			
Mex. Sacred Fir#	M ft.	350.00	400.00
1st Class Pine	M ft.	600.00	750.00
2nd Class Pine	M ft.	500.00	480.00

* 11 meters quoted, 12 meters no longer available.
† Tolteca # Oyamel



For concrete structures large and small

Specify American Welded Wire Fabric

From the world's largest building to small homes—in schools and hospitals, in churches, stores, highways, bridges and viaducts—many of the countless uses of concrete construction are made possible by welded wire fabric reinforcement. And in an impressive number of them you will find American Welded Wire Fabric. It has proved to be the most efficient and economical reinforcement for all sorts of concrete construction.

American Welded Wire Fabric, with its many closely spaced strands of cold-drawn high yield point steel, comes in long rolls and flat sheets. Both provide continuous reinforcement for large areas of floors, walls and roofs. They can be fitted to girders, pillars, beams and other irregular structural shapes. With American Welded Wire Fabric you can reinforce all parts of all concrete structures.

American Welded Wire Fabric can be placed quickly, lies flat and stays in place during pouring. And, since thinner slabs carry higher allowable stresses, you need less steel, less concrete. These savings in construction time, in labor and material costs, are among the important reasons why so many architects and engineers specify U·S·S American Welded Wire Fabric for concrete structures of all sizes.

Many standard designs and sizes of fabric are now readily available. Our technical staff will be glad to supply complete data, to help you select the fabric best fitted to your requirements. Just drop a line to the nearest office on our list, there is no obligation.

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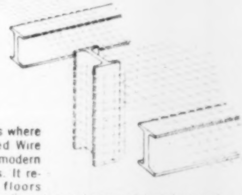
SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



This sketch shows where American Welded Wire Fabric is used in modern concrete buildings. It reinforces walls, floors and roofs, can be draped over beams and girders and wrapped around pillars. Many uses of concrete in irregular structural shapes are made practical by American Welded Wire Fabric reinforcement.

Every type of concrete construction needs

U·S·S AMERICAN WELDED WIRE FABRIC *reinforcement*

UNITED STATES STEEL

Construction wages—ENR 20-cities averages

Construction wage increases average about 5% in 1949 with conditions more stable than at any time since before the war. All signs point to a continuation of this situation through 1950.

Labor supply is plentiful in two-thirds of the 70 cities reporting to ENGINEERING NEWS-RECORD. It is ample or adequate in a sixth and mixed in the other sixth.

Surplus construction labor is reported in Buffalo, Los Angeles, San Diego, Newark. St. Louis reports a slight surplus now. Phoenix and Bismarck report an excess now (February) but expect shortages in 60-90 days.

Shortages of both skilled and common labor are expected in Ft. Worth in March and in Louisville this summer. Pierre, So. Dak., expects a skilled labor shortage in late March.

Shortages of bricklayers exists in Charlotte, N. Car., Harrisburg, Pa., Milwaukee, St. Paul, Minneapolis, Omaha, and is expected later on in Boston and Jamestown, N. Y. A shortage of plasterers exists in Charlotte, N. Car., Indianapolis and Jacksonville, also of pipe coverers in Indianapolis and of plumbers in Milwaukee.

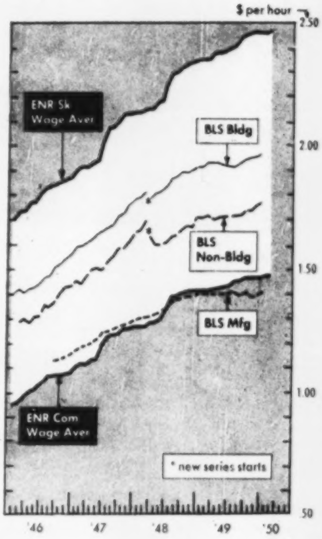
More than two-thirds of the new wage contracts come up from March through June, a sixth throughout the year and the other sixth "at no set time." The early contracts coming through indicate a continuation of last year's pattern—some hold-the-line, some small increases.

SKILLED LABOR (Dollars per Hour)
(Bricklayer, carpenter, ironworker average)

	1926	1932	1939	1945	1946	1947	1948	1949	1950
J	1.24	1.15	1.43	1.64	1.70	1.90	2.14	2.35	2.46
F	1.24	1.11	1.43	1.64	1.73	1.92	2.15	2.35	2.47
M	1.24	1.11	1.43	1.64	1.74	1.92	2.15	2.38	
A	1.25	.95	1.44	1.65	1.76	1.93	2.17	2.38	
M	1.26	.96	1.44	1.65	1.77	1.94	2.18	2.38	
J	1.27	.99	1.44	1.66	1.80	2.02	2.25	2.39	
J	1.27	1.00	1.44	1.66	1.82	2.07	2.29	2.41	
A	1.28	.98	1.44	1.67	1.83	2.08	2.30	2.44	
S	1.28	.99	1.44	1.67	1.84	2.10	2.32	2.45	
O	1.29	.98	1.44	1.67	1.85	2.13	2.33	2.46	
N	1.29	.97	1.46	1.68	1.86	213	2.34	2.46	
D	1.29	.98	1.46	1.68	1.87	2.14	2.35	2.46	
Av.	1.27	1.02	1.44	1.66	1.80	2.02	2.25	2.41	

COMMON LABOR (Dollars per Hour)

	1926	1932	1939	1945	1946	1947	1948	1949	1950
J	.54	.452	.682	.891	.952	1.110	1.272	1.417	1.485
F	.54	.452	.680	.891	.968	1.118	1.272	1.417	1.485
M	.543	.436	.680	.895	.988	1.118	1.283	1.424	
A	.543	.412	.683	.904	1.004	1.133	1.287	1.428	
M	.55	.411	.682	.909	1.018	1.140	1.300	1.431	
J	.55	.412	.684	.916	1.034	1.185	1.352	1.441	
J	.553	.411	.684	.916	1.058	1.233	1.394	1.465	
A	.555	.422	.685	.916	1.071	1.237	1.394	1.470	
S	.555	.431	.685	.917	1.072	1.237	1.401	1.478	
O	.55	.431	.685	.917	1.073	1.263	1.413	1.478	
N	.555	.426	.685	.917	1.078	1.265	1.413	1.478	
D	.555	.427	.685	.938	1.085	1.272	1.413	1.478	
Av.	.548	.4269	.683	.910	1.033	1.193	1.350	1.450	



Average Hourly Earnings Reported by USBLS

	Building				Non-Building				Manufacturing			
	1946	1947	1948	1949	1946	1947	1948	1949	1946	1947	1948	1949
Jan.	1.402	1.594	1.781	1.918		1.451	1.676	1.710		1.174	1.302	1.405
Feb.	1.422	1.598	1.806	1.930	1.296	1.441	1.700	1.714		1.184	1.308	1.401
Mar.	1.411	1.610	*1.786	1.933	1.300	1.473	*1.628	1.703		1.195	1.310	1.400
Apr.	1.423	1.634	1.804	1.934	1.283	1.499	1.600	1.709		1.202	1.314	1.401
May	1.431	1.656	1.815	1.930	1.308	1.508	1.600	1.712		1.224	1.324	1.401
June	1.444	1.661	1.836	1.923	1.313	1.501	1.614	1.712		1.244	1.340	1.405
July	1.473	1.669	1.862	1.922	1.357	1.536	1.634	1.712		1.249	1.356	1.408
Aug	1.482	1.689	1.874	1.932	1.353	1.554	1.639	1.713		1.255	1.373	1.398
Sept	1.510	1.718	1.895	1.940	1.372	1.588	1.663	1.733	1.130	1.267	1.386	1.407
Oct.	1.526	1.738	1.892	1.943	1.403	1.596	1.672	1.736	1.135	1.274	1.390	1.392
Nov.	1.549	1.765	1.906	1.947	1.433	1.615	1.671	1.751	1.146	1.285	1.397	1.391
Dec.	1.569	1.777	1.915	1.973	1.434	1.645	1.712	1.777	1.157	1.295	1.400	1.412

*Series revised to cover both public and private contract construction and to include workers engaged in off-site operations for construction as well as site workers.

Average Earnings and Hours

U. S. Average Nov. 1949	Hourly earnings	Weekly hours
Total building	$1.948	36.1
All building trades	2.056	36.5
Plumbing and heating	2.085	37.5
Painting and decoration	1.996	34.5
Electrical	2.241	38.2
Masonry	2.047	35.0
Plastering and lathing	2.302	32.5
Carpentry	1.915	36.3
Roofing and sheet metal	1.769	36.1
Excavation and foundation	1.864	37.1
Total non-building	1.751	39.9
Highway and street	1.605	40.7
Heavy construction	1.858	39.7
Other	1.831	38.4

Skilled and common wage rates in 20 cities

From monthly reports by Engineering News-Record, per hour, 8-hr. day.

	Bricklayers				Carpenters				Structural Ironworkers				Common Labor (Av Bldg. & Hwy. Constr.)			
	1949			1950	1949			1950	1949			1950	1949			1950
ENR 20-Cities	Low	Ave.	High	Feb.	Low	Ave.	High	Feb.	Low	Ave.	High	Feb.	Low	Ave.	High	Feb.
Atlanta	$2.50	$2.50	$2.50	$2.50	$1.775	$1.817	$1.85	$1.85	$2.00	$2.02	$2.125	$2.125	$.90	$.90	$.90	$.90
Baltimore	3.00	3.00	3.00	3.00	2.20♯	2.238	2.25	2.20	2.40	2.50	2.65	2.55	1.25	1.25	1.25	1.25
Birmingham	2.25	2.45	2.50	2.50	1.80	1.88	1.95	1.95	2.15	2.162	2.20	2.20	1.00	1.029	1.05	1.05
Boston	2.50	2.594	2.625	2.625	2.10	2.187	2.25	2.25	2.40	2.437	2.55	2.55	1.55	1.625	1.65	1.65
Chicago	2.40	2.46	2.55	2.55	2.35	2.40	2.45	2.45	2.40	2.45	2.50	2.50	1.70	1.75	1.80	1.80
Cincinnati	2.50	2.538	2.575	2.575	2.20	2.217	2.25	2.25	2.35	2.39	2.45	2.425	1.46	1.479	1.498	1.535
Cleveland	2.375	2.458	2.575	2.575	2.375†	2.467	2.575	2,575	2.375	2.458	2.575	2.575	1.725	1.757	1.788	1.788
Dallas	2.50	2.50	2.50	2.50	2.125–2.25	2.125–2.25	2.125–2.25	2.125–2.25	2.25	2.25	2.25	2.25	1.175	1.175	1.175	1.283
Denver	2.25	2.50	3.00	3.00	2.10	2.10	2.10	2.10	2.00	2.03	2.10	2.10	1.375	1.375	1.375	1.375
Detroit	2.50	2.56	2.625	2.625	2.20	2.26	2.325	2.325	2.40	2.473	2.575	2.575	1.575	1.625	1.675	1.675
Kansas City	2.50	2.566	2.60	2.60	2.05	2.117	2.15	2.15	2.20	2.267	2.30	2.30	1.438	1.514	1.575	1.575
Los Angeles	2.625	2.625	2.625	2.625	2.038	2.072	2.12	2.12	2.30	2.30	2.30	2.38	1.488	1.522	1.57	1.57
Minneapolis	2.25	2.30	2.40	2.40	2.05	2.07	2.12	2.12	2.175	2.20	2.275	2.275	1.45	1.47	1.52	1.52
New Orleans	2.05	2.425	2.50	2.50	1.875	1.875	1.875	1.875	2.00	2.208	2.25	2.25	.90	1.00	1.025	1.025
New York	3.20a	3.20a	3.20a	3.20a	2.75a	2.75a	2.75a	2.75a	3.00	3.00	3.00	3.00	1.70	1.70	1.70	1.70
Philadelphia	2.75	2.895	3.00	3.00	2.25	2.32	2.37	2.37	2.65	2.65	2.65	2.65	1.25	1.40	1.525	1.525
Pittsburgh	3.00	3.00	3.00	3.00	2.50	2.50	2.50	2.50	2.50	2.52	2.625	2.625	1.50	1.50	1.50	1.50
St. Louis	2.75	2.79	2.833*	2.833	2.45	2.45	2.45	2.45	2.425	2.462	2.50	2.50	1.53	1.588	1.625	1.613
San Francisco	2.813	2.813	2.813	2.813	2.16	2.17	2.225	2.225	2.40	2.425	2.50	2.50	1.525	1.534	1.55	1.55
Seattle	2.495	2.683	3.00	3.00	2.195	2.195	2.195	2.195	2.395	2.395	2.395	2.395	1.748	1.802	1.813	1.813
Montreal	1.40	1.40	1.40	1.40	1.25	1.25	1.25	1.25	1.30	1.30	1.30	1.25	.85	.88	.91	.85

a 7 hr. day. *St. Louis—3% vacation stamp fund incl. eff. July '49. ♯Baltimore—5¢/hr. reduction last 3 mos. of year pending new 2-yr. contract. †Includes 5¢/hr. tool replacement.

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Canadian wage rates for 8 building trades in 11 cities

Rates from Dominion Bureau of Statistics, and Canadian Construction Association

	Bricklayers			Carpenters			Electricians			Painters		
	1939	1948	1949	1939	1948	1949	1939	1948	1949	1939	1948	1949
Halifax	$1.00	$1.44	$1.47	$.70	$1.23	$1.26	$.85	$1.33	$1.36	$.60	$1.00	$1.10
Saint John	.90	1.45	1.45	.50-.60	1.00	1.10	.50-.65	1.10	1.10	.50-.55	.96	1.00
Quebec	.75-.85	1.50	1.30	.55-.60	1.00	1.10	.55-.65	1.00	1.10	.50-.55	.95	1.05
Montreal	.80-.90	1.40-1.75	1.40-1.75	.70	1.25	1.25	.75	1.35	1.35	.66	1.15	1.15
Toronto	1.00	1.75	1.80	.90	1.50	1.60	1.00	1.65	1.75	.75	1.20	1.35
Hamilton	.90	1.60	1.70	.75	1.40	1.50	.75	1.40	1.55	.65	1.10	1.20
Windsor	1.15	1.65	1.75	.95	1.50	1.60	1.15	1.65	1.75	.60-.65	1.20	1.25-1.35
Winnipeg	1.10	1.55	1.60	.85	1.35	1.40	.85	1.35	1.40	.70	1.15	1.20
Saskatoon	1.00	1.50	1.67	.50-.75	1.32	1.39	.70-.80	1.30	1.37	.50-.70	1.00	1.15
Edmonton	1.10	1.75	1.80	.90	1.40	1.47½	.85	1.27	1.60	.80	1.25	1.25
Vancouver	1.10	1.75	1.80	.75-.90	1.55	1.60	.75-1.00	1.70	1.70	.63-.80	1.35	1.40

	Plasterers			Plumbers			Sheetmetal Workers			Labourers		
	1939	1948	1949	1939	1948	1949	1939	1948	1949	1939	1943	1949
Halifax	$.80	$1.32	$1.38	$.85	$1.30	$1.33	$.70	$1.10	$1.16	$.30-.40	$.75	$.81
Saint John	.90	1.35	1.45	.60-.70	1.15	1.25	.50-.65	.90	1.20	.30-.40	.65	.65-.85
Quebec	.75	1.20	1.30	.55-.65	1.00	1.10	.55-.65	1.00	1.10	.40	.75	.75
Montreal	.80	1.50	1.40-1.50	.75	1.45	1.55	.65-.75	1.25	1.25	.40	.80	.80
Toronto	.90	1.55	1.90	1.00	1.55	1.75	.93	1.50	1.75	.35-.50	1.00	.95-1.00
Hamilton	.90	1.50	1.70	.85	1.60	1.60	.75	1.25	1.55	.35-.45	.80	.85-.95
Windsor	.90	1.55	1.65	1.00	1.65	1.75	.70-.85	1.50	1.60	.55	1.00	1.10-1.35
Winnipeg	1.10	1.50	1.60	.95	1.50	1.55	.70	.95	1.10	.40-.45	.75	.75-.95
Saskatoon	.75-1.00	1.50	1.67	1.00	1.45	1.50	.75-.90	1.10	1.25	.30-.40	.75	.85
Edmonton	1.05	1.60	1.85	1.05	1.50	1.60	.90	1.45	1.55	.40-.50	.90	.95
Vancouver	1.00	1.75	1.75	1.00	1.65	1.70	1.00	1.65	1.70	.45-.50	1.00	1.15

Note: Vacation Pay Assessments for above trades are as follows: Montreal—2%, Toronto—4% (except for painters and sheetmetalworkers), Hamilton—2-4%, Windsor—4%, Winnipeg—2%, Saskatoon—4%, Edmonton—4%, Vancouver—2½%.

Wage changes in Canada

Construction wages in eight cities of Canada increased 5.3% during 1949 for the seven principal trades. This compares with a 4.1% rise for all union building trades workers in the United States. The Canadian period is December 1, '48 to '49, the U. S. July 1, '48-49. In the 10-year checkup, Canadian building trades increased wages 86% while their cost of living went up only 58.7%. U. S. building trades workers in the same period increased their wages 70.3% and their consumers' price index went up 69%.

The Canadian Construction Association points out that, "wage-rate statistics alone do not fully reflect the rise in construction workers' incomes. The increase since 1939 due to more continuous employment, up-grading, overtime etc. is considerably more than percentage increases in wage-rates indicate. For example, a man who worked as a labourer in 1939 today receives wage-rates on the average of 126.6% greater if he is still a labourer, but more than 400% greater if he has since attained journeyman status as a bricklayer."

Canadian wage and cost of living changes—1939-'49

Unweighted average wage increases for 8 principal construction occupations (including vacation pay allowances)

Increase in City	Wages, % '39-'49	C of L, % '39-'49	Wages, % '47-'48	Wages, % '48-'49	Cost of living, % '47-'48	Cost of living, % '48-'49
Vancouver	92.8	61.9	14.3	3.2	10.1	0.7
Edmonton	79.9	56.4	9.6	9.8	9.8	1.8
Saskatoon	96.4	62.7	14.2	6.9	9.6	0.7
Winnipeg	67.6	55.7	5.5	5.2	8.1	2.3
Toronto	97.1	57.4	10.8	5.9	7.3	1.9
Montreal	89.6	64.1	11.7	3.4	8.7	1.6
Saint John	89.9	58.0	11.0	5.2	8.1	1.6
Halifax	74.6	53.6	13.1	2.6	6.3	1.9
Unwgtd aver, 8 cities	86.0	58.7	11.3	5.3	8.4	1.6

High cost of construction accidents and injuries

Accidents and injuries in 1948 cost construction $770 million, according to estimates of the U. S. Bureau of Labor Statistics. Ranging from fatalities down to temporary total disabilities these are analyzed by BLS in the accompanying tables:

Work injuries in construction

	Construction		1948	1949
I	All disabilities	Total	193,000	183,000
		to employees	150,000	142,000
II	Fatalities	Tot	2,100	2,100
		to empl	1,700	1,700
III	Permanent-total	Tot	300	300
		empl	200	200
III	Perm-partial	Tot	7,800	7,300
		empl	6,000	5,700
IV	Temporary-total	Tot	182,800	173,300
		empl	142,100	134,400

(Based on small sample studies by BLS)

Work injury rates in construction, 1948

(FREQUENCY RATE is number of disabling injuries per million hours worked. SEVERITY RATE is average number of days lost per thousand hours worked)

	Frequency rates				Severity		
Industry	I	II	III	IV	Disab	Temp total	Sever rate
Total	36.7	.4	1.5	34.8	135	14	5.0
General contractors	40.0	.5	1.3	38.2	124	14	5.0
Building constr	39.0	.4	1.1	37.5	101	13	3.9
Heavy & marine constr	39.2	.6	1.5	37.1	148	15	5.8
Hwy & st constr	43.3	.6	1.3	41.4	126	13	5.5
Special-trade contr	32.1	.4	1.7	30.0	154	15	5.0
Carpentering	34.3	.3	2.2	31.8	135	13	4.6
Concrete work	28.2	.3	.7	27.2	136	17	3.8
Electrical work	21.2	.4	.9	19.9	204	15	4.3
Excav & fndn wk	31.3	.1	1.5	29.7	80	14	2.8
Gen'l bldg maint	20.0	1.1	.5	18.4	343	21	6.9
Glass & glazing	33.7	...	.9	32.8	42	11	1.4
House moving	33.1	1.8	.9	30.4	343	12	11.4
Instal of machy & equip, nec	46.7	.3	8.7	37.7	161	14	7.5
Insulation work	32.7	.2	.8	31.7	61	13	2.0
Masonry & stone wk	36.9	.1	.7	36.1	76	12	2.8
Ornam iron & st wk	49.4	.7	3.4	45.3	161	14	8.0
Paint, paper hang & decor	19.2	.4	1.2	17.6	239	18	4.6
Parquet & hrdwd-fl wk	15.9	.3	.6	15.0	147	22	2.3
Plastering & lathing	39.0	.2	1.0	37.8	82	13	3.2
Plumb, heat & air cond	30.6	.2	1.2	29.2	112	11	3.4
Roof & sheet metal wk	40.0	.3	.9	38.8	102	13	4.1
Struct-steel work	52.4	1.2	4.5	46.7	293	21	15.4
Trzo, tile, marble, & mosaic wk	19.4	.3	1.0	18.1	205	13	4.0
Wrecking & demol wk	58.3	.3	2.8	55.2	90	14	5.2

Wage rates—New York City

Dollars per hour

Year	Carpenters	Bricklayers	Masons' Laborers	Common Laborers	Structural Ironwkrs
1874	$0.23 (10 hrs.)	$0.43 (8 hrs.)	$0.18 (8 hrs.)	$0.14 (10 hrs.)	.....
1890	.43 (8 hrs.)	.47 (8 hrs.)	.28 (8 hrs.)	.14 (9 hrs.)	..... (8 hrs.)
1907	.63	.70	.38	.22 (8 hrs.)	$0.60
1913	.63	.70	.38	.23	.63
1930	1.65	1.93	1.03	1.03	1.93
1932	1.33 (7 hrs.)	1.47 (7 hrs.)	1.00 (7 hrs.)	.65	1.68
1938	1.75	1.89	1.00	.91	1.93
1939	1.75	1.89	1.03	.91	1.93
1942	1.85	2.00	1.03	.95	2.00
1946	2.10	2.25	1.23	1.20	2.25
1947	2.47	2.65	1.44	1.44	2.56
1948	2.73	2.94	1.62	1.63	2.98
1949	2.75	3.20	1.70	1.70	3.00

Mexico City—Mex wages

In Pesos, per hr., 8 hr. day	Dec. '47	Dec. '48	Dec. '49
Common Wages—Building	$0.57	$0.57	$0.57
Heavy Const.	0.75	0.75	0.75
Skilled Labor Wages			
Carpenters	1.25	1.25	1.25
Bricklayers	1.25	1.25	1.25
Struct. Iron Wrkrs	1.50	1.50	1.50

San Juan, Puerto Rico wages

February, 1950	Prevail'g Paid	Legal Minimum*
Unskilled labor	$0.34	0.32
Trench diggers	0.40	....
Helpers, carpenter, mason etc.	0.45	0.45
Carpenters	0.695	0.60-0.75
Masons	1.00	0.75
Reinf. St. placers	0.65	0.60
Reinf St. binders	0.47	0.45
Equipment operators	1.20	1.10
Welders	1.10	.75
Mechanics	1.05	0.60
Sub-Foremen	0.81	0.75
Foremen-per week	65.00	0.90

8-hr day 44-hr week double for overtime

*Insular Minimum Wage Law approved 1946

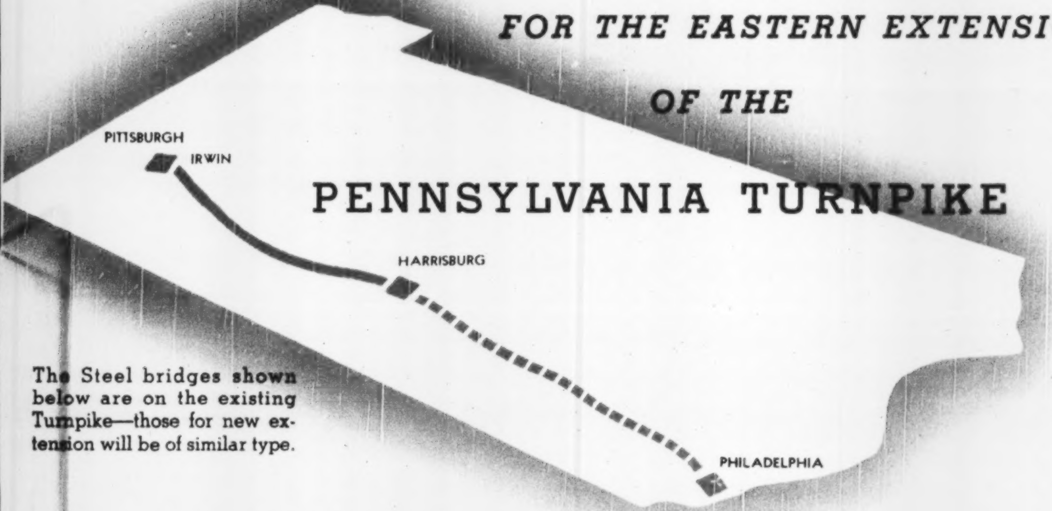
U. S. Consumers' Price Index, BLS

1935-'39=100	1939	1945	1946	1947	1948	1949
January	....	127.1	129.9	153.3	168.8	170.9
February	....	126.9	129.6	153.2	167.5	169.0
March	99.2	126.8	130.2	156.3	166.9	169.5
April	....	127.1	131.1	156.2	169.3	169.7
May	....	128.1	131.7	156.0	170.5	169.2
June	98.2	129.0	133.3	157.1	171.7	169.6
July	....	129.4	141.2	158.4	173.7	168.5
August	....	129.3	144.1	160.3	174.5	168.8
September	101.3	128.9	145.9	163.8	174.5	169.6
October	....	128.9	148.6	163.8	173.6	168.5
November	....	129.3	152.2	164.9	172.2	168.6
December	100.1	129.9	153.3	167.0	171.4	167.5

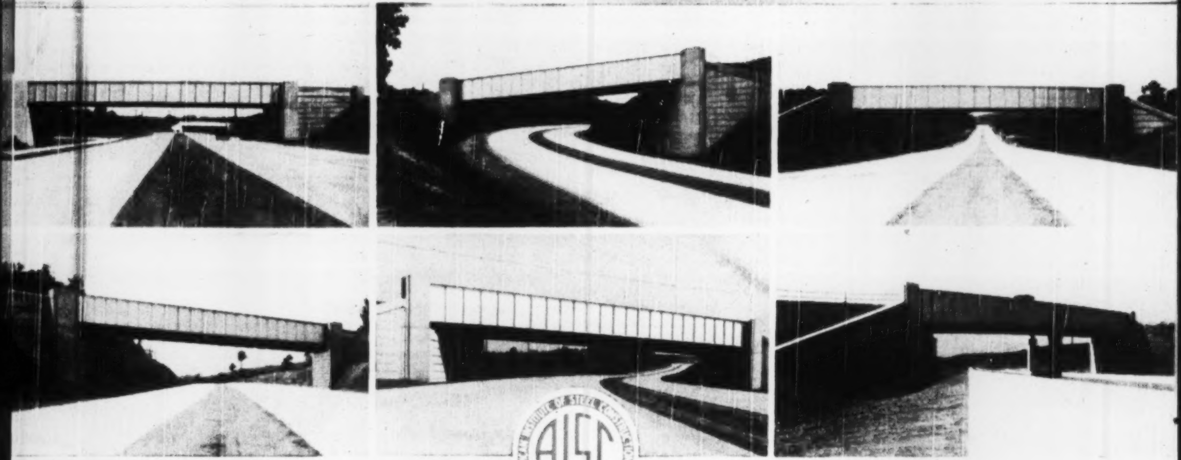
1926 June, 124.1, Dec., 124.5. **1932** June, 101.1, Dec., 97.3.

STEEL BRIDGES

FOR THE EASTERN EXTENSION OF THE PENNSYLVANIA TURNPIKE



The Steel bridges shown below are on the existing Turnpike—those for new extension will be of similar type.



"Steel Permits Streamlining Construction With Safety, Endurance and Economy."

Because of the excellent service records made by the Steel Bridges on the present Pennsylvania Turnpike—when the extension was planned it was decided to again specify STEEL BRIDGES. Many of these, too, will be fabricated by Fort Pitt Bridge.

Fort Pitt BRIDGE WORKS
Member American Institute of Steel Construction
General Offices, Pittsburgh, Pa. · Plant at Canonsburg, Pa.
BRANCH OFFICES
New York, N.Y., 441 Lexington Avenue - Columbus, Ohio . Huntington Bank Bldg.
Cleveland, Ohio . . Bulkley Building   Detroit, Michigan . New Center Bldg.

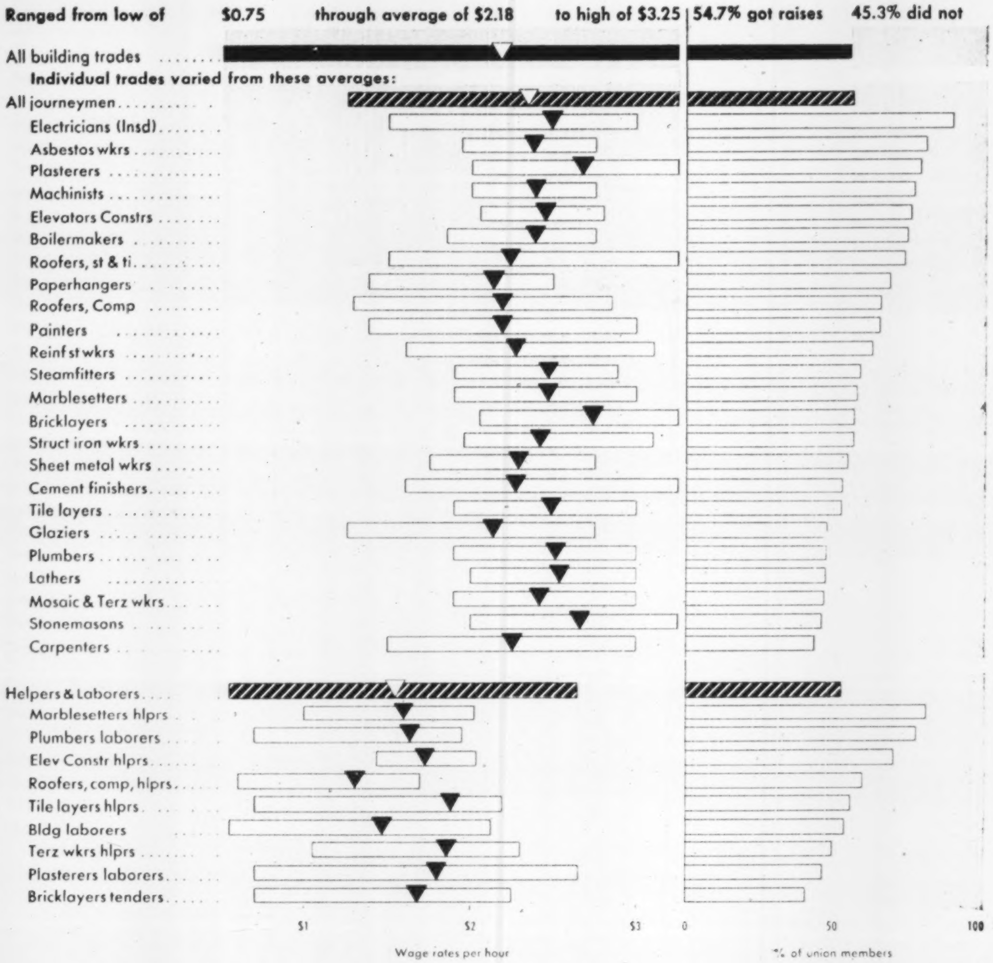
Building trades wage rates—$/hr., 8-hr. day—February 1, 1950

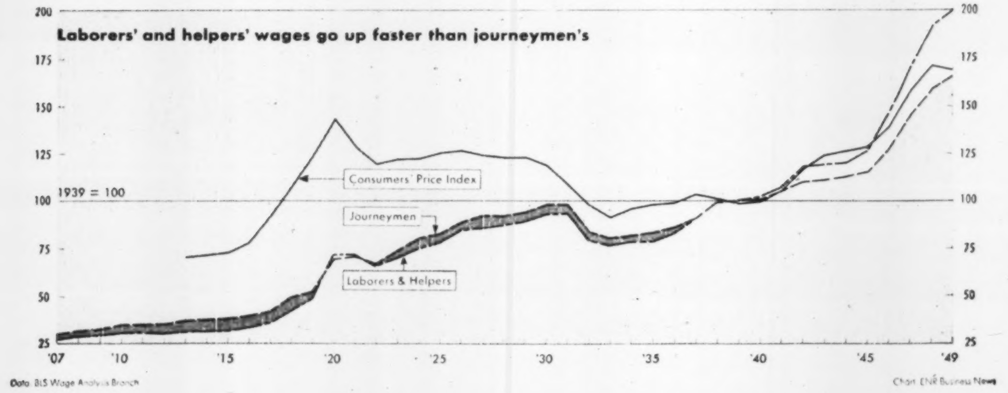
Compiled by Engineering News-Record City and State	Carpenters	Bricklayers	Structural Ironworkers	Reinforcing Ironworkers	Common Labor Bldg.	Common Labor, Hvy Constr.	Stonemasons	Mason's Helpers	Plasterers	Mosaic & Terazzo	Tile Layers	Cement Finishers	Lathers	Electricians (Inside)	Painters	Glaziers	Plumbers	Steamfitters	Roofers	Waterproofers	Sheet Metal Workers	Welders	Hoist Eng., 1-Drum	Hoist Eng., 2-Drum	Tractor Oper. (Over 30-hp)	Power Shovel Operator	Truck Drivers (Over 1½ T.)
Anderson, Ind.	[1]$1.95	$2.50	$2.45	$2.45	§1.35	$1.35	$2.50	$1.55	$2.00	$2.50	[11]$2.50	$2.00	$2.15	$2.15	$1.75	$2.00	$2.15	$2.15	$1.75	$1.75	$2.00	$2.45	$2.00	$2.40	$2.40	$2.40	[54]$1.55
Atlanta, Ga.	1.85	2.50	2.13	1.88	.90	.95	2.50	1.00	2.25	2.50	2.50	2.10	2.25	2.25	[16]1.85	1.85	2.50	2.00	2.00	1.75	1.93	2.25	2.00	2.25	2.00	2.00	1.50
Austin, Tex.	1.90	3.00	2.25	2.00	.75	.75	3.00	1.25	2.50	3.00	2.50	2.00	2.00	2.25	1.75	1.75	[28]2.25	2.25	1.50	.....	2.00	2.25	1.75	2.00	1.75	2.00	[H]1.25
Baltimore, Md.	2.20	3.00	2.55	2.25	1.25	1.25	3.00	**	2.25	2.25	2.25	2.15	2.25	2.25	[17]1.78	2.05	2.25	2.25	[30]1.85	1.85	2.25	*	[34]1.88	[34]2.40	[34]1.70	[34]2.40	[N]1.50
Billings, Mont.	2.00	2.75	2.25	2.25	1.47	1.47	2.75	.....	2.50	2.75	2.28	2.50	2.25	[14]2.13	2.25	1.75	2.28	2.28	1.75	.....	2.28	2.00	1.80	2.00	2.00	2.15	1.65
Birmingham, Ala.	1.90	2.50	2.20	1.95	1.00	1.10	2.50	1.00	2.20	2.00	2.00	2.08	2.00	2.25	2.00	1.88	2.25	2.25	[30]1.60	1.85	2.00	2.00	1.88	2.13	1.88	2.13	1.20
Bismarck, N. D.	1.75	2.38	2.25	2.25	[K]1.30	[K]1.30	2.38	1.25	2.25	.....	2.38	2.00	1.75	2.05	1.60	1.60	2.10	2.10	1.75	1.75	1.75	*	1.85	2.00	1.85	2.00	1.25
Boise, Idaho	1.93	1.80	2.15	.....	1.45	1.45	1.80	**	2.43	.....	1.80	[12]2.18	2.30	2.15	[18]1.88	2.75	2.18	2.18	1.80	.....	1.85	[33]2.00	1.75	1.85	[46]1.85	[g]2.25	[55]1.55
Boston, Mass.	2.25	2.63	2.55	2.55	1.65	1.65	2.63	1.65	2.70	2.38	2.38	2.63	2.70	2.50	..	2.10	2.45	2.45	2.30	2.30	2.45	2.45	[35]2.60	[35]2.60	[36]2.40	[35]2.60	1.45
Buffalo, N. Y.	[4]2.25	2.50	2.40	2.40	1.65	1.65	2.50	**	2.40	2.25	2.25	2.23	2.40	2.58	2.13	2.10	2.40	2.40	2.15	2.15	2.25	.....	2.24	2.24	2.28	2.40	1.66
Burlington, Vt.	1.75	2.25	.....	.....	1.00	1.15	2.25	1.15	2.25	.....	.....	.....	.....	1.75	1.50	.....	1.65	1.65	1.80	.....	1.93	.....	.....	1.50	.....	1.90	1.10
Charleston, S. C.	1.50	2.25	2.00	1.75	.75	.75	2.25	[B].85	2.25	1.75	2.00	1.50	1.50	2.00	1.38	1.38	2.00	2.00	1.50	1.50	1.50	2.00	1.00	1.25	1.50	1.50	.80
Charleston, W. Va.	2.13	2.50	2.38	2.38	1.35	1.35	2.50	1.50	2.25	2.30	2.30	2.00	2.13	2.30	[19]2.00	2.00	2.25	2.25	1.75	1.75	2.05	*	2.25	2.25	1.80	2.25	1.45
Charlotte, N. C.	1.65	2.25	2.00	2.00	[C].88	.83	2.25	.93	2.25	2.25	2.25	1.60	2.25	1.85	1.50	1.44	2.13	2.13	1.65	1.65	1.80	1.50	1.38	1.63	[O]1.63	[N]1.50	1.25
Chicago, Ill.	2.45	2.55	2.50	2.50	1.80	1.80	2.55	1.80	2.55	2.45	2.50	2.45	2.55	2.53	2.38	2.55	2.45	2.45	[30]2.50	2.50	2.45	2.50	2.45	2.45	2.15	2.75	[55]1.55
Cincinnati, Ohio	2.25	2.58	2.43	2.28	1.54	1.54	2.58	1.74	2.43	2.40	2.40	2.15	2.25	2.45	2.10	2.38	2.40	2.40	[30]2.05	1.54	2.23	2.43	2.38	2.38	2.13	2.38	1.70
Cleveland, Ohio	2.58	2.58	2.58	2.58	1.85	1.73	2.58	1.85	2.53	2.38	2.38	1.85	2.53	2.53	2.28	2.40	2.58	2.58	2.45	2.45	2.40	2.58	2.58	2.58	2.28	2.53	1.42
Columbia, S. C.	1.50	2.00	1.75	2.00	.80	.....	2.00	.....	2.00	.....	.....	2.00	.....	1.75	[Z]2.00	.....	2.25	2.25	1.75	1.75	1.75	*	1.50	1.75	1.50	2.00	.....
Columbus, Ohio	2.18	2.65	2.38	2.38	1.43	1.43	2.65	1.63	2.25	1.88	2.15	2.13	2.38	2.38	2.00	1.38	2.38	2.38	2.00	.....	2.25	2.38	2.38	2.38	2.38	2.38	1.50
Concord, N. H.	1.65	2.50	2.25	2.25	1.25	1.25	2.50	1.45	2.50	2.50	2.50	2.50	1.65	1.75	1.35	.....	1.90	1.90	1.65	.....	1.90	1.90	2.15	2.15	1.70	2.15	1.25
Conway, Ark.	1.50	3.00	.....	.....	.75	[A].80	[h]2.50	[E]1.25	[Y]1.75	.....	.....	2.00	1.50	[Y]1.75	1.50	1.50	1.50	1.25	1.50	.....	1.50	1.50					
Dallas, Tex.	2.13	2.50	2.25	2.00	1.08	[Q]1.50	2.50	1.23	2.50	2.38	2.38	2.13	2.50	2.38	2.00	1.75	2.38	2.38	1.75	.....	2.25	.....	[36]2.00	[37]2.25	2.25	2.25	1.13
Dayton, Ohio	2.27	2.62	2.42	.....	1.52	1.40	2.62	1.57	2.42	.....	2.37	2.10	2.42	2.62	2.15	2.07	2.39	2.39	.....	2.07	2.28	2.28	2.28	.....	1.95	2.28	1.58
Denver, Colo.	2.10	3.00	2.10	2.10	1.40	1.35	3.00	1.75	2.50	2.38	2.38	2.25	2.50	2.41	2.05	2.00	2.40	2.40	2.10	2.10	2.13	2.25	2.10	2.25	2.10	2.25	1.50
Des Moines, Ia.	2.00	2.88	[8]2.25	N.A.	1.50	N.A.	.....	1.50	2.38	2.13	2.13	2.13	2.20	[6]2.35	1.85	1.85	2.38	2.38	1.63	N.A.	2.13	N.A.	N.A.	N.A.	N.A.	N.A.	1.55
Detroit, Mich.	2.33	2.63	2.58	2.20	1.68	1.68	2.63	1.78	2.63	2.53	2.53	2.18	2.63	2.60	2.10	2.00	2.50	2.50	2.40	2.63	2.40	2.20	2.58	2.58	1.80	2.33	1.80
Duluth, Minn.	1.93	2.25	2.25	2.00	[U]1.50	[U]1.50	2.25	1.50	2.35	N.A.	2.00	1.85	2.25	2.20	1.80	1.60	2.13	2.13	[V]1.95	[V]1.95	2.10	*	2.07	2.07	[46]1.87	[45]2.27	1.50
E. Lansing, Mich.	2.00	2.50	2.58	2.20	1.45	1.45	.....	1.53	2.50	.....	.....	2.00	2.25	2.40	1.90	.....	2.25	.....	1.95	1.75	2.10	.....	[38]2.33	[44]2.58	.....	.....	.....
Fort Worth, Tex.	2.00	2.50	2.25	2.00	.90	.95	2.50	.95	2.50	2.13	2.13	2.25	2.50	2.25	2.00	1.75	2.25	2.25	1.75	1.75	2.25	2.25	2.00	2.25	1.10	[52]2.25	1.10
Harrisburg, Pa.	1.90	2.50	2.65	2.65	1.27	1.27	2.50	1.38	2.25	2.25	2.40	2.13	2.38	2.25	1.69	1.94	2.25	2.25	1.50	1.50	2.10	*	2.65	2.65	2.28	2.90	1.33
Helena, Mont.	2.00	2.50	2.25	2.25	1.38	1.38	2.50	1.60	2.00	2.00	2.00	2.50	2.00	1.90	1.75	2.00	2.00	.....	2.00	.....	2.00	.....	1.80	2.00	2.00	2.00	1.50
Houston, Tex.	2.13	§2.63	2.25	2.13	.....	1.20	2.63	1.40	2.75	2.38	2.38	2.13	2.50	2.50	2.00	2.00	2.38	2.38	2.00	1.88	2.38	*	1.88	2.25	1.88	2.25	1.25
Indianapolis, Ind.	2.30	2.58	2.45	2.45	1.50	.....	2.58	1.70	2.50	2.00	2.33	2.08	2.38	2.38	2.13	2.00	2.43	2.43	[30]1.75	.....	2.30	2.35	2.40	[35]2.60	2.40	2.40	1.55
Jackson, Miss.	1.90	2.50	2.00	2.00	.90	.90	2.50	2.50	2.15	2.50	2.50	2.15	1.60	2.00	1.75	1.75	2.25	2.25	1.50	1.50	1.80	2.00	1.90	1.90	1.90	2.05	1.00
Jacksonville, Fla.	1.75	2.30	2.00	1.60	.85	.92	2.30	.92	2.25	2.00	2.00	1.60	2.13	2.38	1.63	1.75	2.50	2.50	1.65	2.30	1.80	1.50	[38]1.80	[38]1.80	1.48	1.80	1.25
Jamestown, N. Y.	[2]2.00	[9]2.50	2.38	2.38	1.50	[X]1.65	2.50	2.25	2.50	2.20	2.10	2.50	2.50	1.88	1.75	1.85	2.15	2.15	1.85	1.85	1.85	2.15	2.50	2.68	2.50	2.50	[Y]1.50
Jefferson, City, Mo.	2.00	2.38	2.50	2.50	1.15	1.15	2.38	1.50	1.50	.....	.....	2.25	2.00	2.00	1.75	1.75	2.00	2.00	1.25	.....	1.50	1.15	1.85	2.20	2.25	2.50	1.85
Kansas City, Mo.	2.15	2.60	2.30	.....	1.58	1.58	2.35	1.75	2.75	2.35	2.35	2.15	2.45	2.48	2.05	2.25	2.50	2.50	2.00	[32]2.00	2.43	*	2.15	2.38	[47]2.15	2.38	[56]1.65
Little Rock, Ark.	[d]2.00	3.00	2.50	2.50	[C].88	[G].95	[l]3.00	[J]1.75	[d]2.00	1.75	1.75	2.50	[d]2.00	1.88	2.00	2.00	1.88	1.88	1.88	1.88	2.00	2.25	.....	.....	.....	.....	.....
Los Angeles, Calif.	2.12	2.63	2.38	2.20	1.57	1.57	2.65	1.83	3.13	2.40	2.50	2.20	2.85	2.50	[20]2.08	2.04	2.50	2.50	2.25	2.25	2.25	*	2.07	2.07	2.12	2.32	[57]1.65
Louisville, Ky.	2.15	2.60	2.30	2.10	1.45	1.45	2.60	[F]1.50	2.50	2.25	2.25	2.15	2.25	2.45	1.86	2.00	2.34	2.38	2.15	2.18	2.15	2.30	2.00	2.20	1.75	2.20	1.55
Meridian, Miss	2.00	2.25	1.75	1.75	.75	1.00	2.00	.75	1.75	2.25	2.25	2.25	1.75	1.75	1.75	1.75	2.00	2.00	1.75	1.75	1.75	1.75	2.00	2.25	2.00	2.00	1.00
Milwaukee, Wis.	2.10	2.50	2.25	2.15	1.65	1.65	2.50	1.75	2.25	2.20	2.15	2.05	2.25	2.25	1.95	2.05	2.35	2.35	[31]2.15	2.00	2.15	2.25	2.15	2.15	2.10	2.45	1.60
Minneapolis, Minn.	2.12	2.40	2.28	2.28	1.52	1.52	2.40	2.02	2.50	§2.15	§2.25	2.22	2.42	2.35	2.05	1.92	2.32	2.32	2.00	2.00	2.25	*	2.07	2.07	[b]2.07	2.27	[a]1.87
Nashville, Tenn.	1.80	2.50	2.00	2.00	.85	.85	2.50	1.00	2.50	2.50	2.50	1.75	2.25	2.25	1.74	1.65	2.25	2.25	1.55	1.55	1.85	[e]2.25	1.63	1.88	[48]1.63	2.00	1.20
New Orleans, La.	1.88	2.50	2.25	2.25	1.03	1.03	2.50	1.13	2.18	.....	.....	1.88	2.18	2.30	1.75	1.88	2.25	2.25	1.73	1.73	1.93	1.93	[40]2.13	2.13	1.88	2.13	1.08
New York, N. Y.	†2.75	†3.20	3.00	†2.75	1.70	1.70	†3.20	†1.95	†3.20	2.75	2.75	†2.75	†2.75	#3.00	[21]† 2.45 [22]†	†2.75	[29]† 3.00	†2.75	†2.75	†2.75	[42]2.75	*	[41]2.50	[42]2.75	[49]2.38	[53]3.13	1.64
Newark, N. J.	†3.00	†3.25	3.00	3.10	†2.13	†2.13	.....	.....	†3.25	.....	.....	†3.25	2.75	3.00	2.50	.....	2.88	2.88	†2.85	.....	2.75	.....	.....	.....	.....	.....	.....
Norfolk, Va.	1.75	2.50	2.15	1.90	.80	.80	2.50	.85	2.50	2.50	2.50	[13]1.75	2.50	2.10	1.88	1.88	2.25	2.25	1.75	1.75	1.90	*	1.75	2.00	[48]1.75	2.00	1.00
Oklahoma City	2.13	3.00	2.13	2.13	1.30	1.30	3.00	1.45	3.00	2.25	2.25	2.25	3.00	2.25	1.88	1.75	2.38	2.38	1.65	.....	2.00	*	1.75	2.00	2.00	2.00	1.38
Omaha, Neb.	2.08	2.40	2.18	2.18	1.30	1.30	2.40	1.30	2.40	2.25	2.25	2.08	2.28	2.35	1.85	1.83	2.35	2.35	1.73	1.73	2.10	2.18	2.00	2.28	2.00	2.00	1.30
Philadelphia, Pa.	†2.40	[6]3.06	2.65	2.40	†1.38	†1.68	2.63	1.38	§3.00	2.60	2.60	2.40	2.85	2.88	2.15	2.24	2.75	2.75	[30]2.28	[i]2.70	[7]2.58	*	2.50	2.50	2.50	2.90	1.45
Phoenix, Ariz.	2.35	3.00	2.25	2.10	1.45	1.45	3.00	1.75	2.50	3.00	3.00	2.10	2.50	[k]2.60	2.00	2.00	2.25	2.68	2.00	3.00	1.90	2.02	1.97	1.97	2.02	2.25	1.52
Pierre, S. D.	[c]1.60	2.25	1.75	1.65	1.00	[L]1.25	[g]2.25	1.00	[c]1.75	.....	[e]2.25	[c]1.75	1.60	1.75	[R]1.50	[d]2.00	1.75	1.75	[Y]1.75	[R]1.50	1.75	[Y]1.75	1.35	[X]1.65	[P]1.68	1.68	[I]1.50
Portland, Ore.	1.10	2.75	2.30	2.10	1.70	1.65	2.75	2.00	2.60	2.38	2.38	2.16	2.50	2.40	2.10	2.04	2.38	2.38	2.20	2.20	2.15	1.95	2.00	2.30	2.00	2.35	1.70
Providence, R. I.	2.10	2.63	2.45	2.45	1.50	1.50	2.63	1.50	2.70	[10]1.90	[10]1.90	2.00	2.70	2.00	1.85	1.85	2.40	2.40	2.25	2.25	2.25	2.25	[34]2.50	[34]2.50	[34]2.50	[34]2.50	1.15
Raleigh, N. C.	1.50	[d]2.00	[V]1.50	.....	.75	[D]1.00	[d]2.00	.85	[Y]1.75	2.00	2.00	1.50	1.25	1.75	1.50	.....	2.25	2.25	1.35	.....	1.50	.....	.....	.....	.....	.....	.....
Richmond, Va.	1.90	2.50	2.30	2.06	.90	1.25	2.00	2.33	2.25	2.25	1.80	1.80	2.25	2.50	1.68	1.75	2.25	2.25	2.00	.....	2.60	.....	1.75	2.00	2.00	1.75	1.10
St. Louis, Mo.	[6]2.45	[7]2.83	2.50	2.50	1.60	[Y]1.75	2.75	1.85	[9]2.50	2.50	2.50	2.50	2.50	[15]2.55	§2.32	2.50	2.50	2.50	[30]2.74	2.38	2.50	*	2.00	2.55	2.55	2.55	1.50
St. Paul, Minn.	2.12	2.40	2.28	2.28	1.52	1.52	2.40	2.02	2.42	§2.15	§2.25	2.07	2.42	2.35	2.00	1.92	2.32	2.32	2.00	2.00	2.25	*	2.07	2.07	[b]2.07	2.27	[a]1.87
Salt Lake City	1.88	2.25	2.15	2.08	1.33	1.33	1.73	1.73	2.25	2.05	2.05	1.88	2.25	2.00	1.88	1.75	2.10	2.10	1.88	.....	2.00	.....	1.83	1.93	1.85	2.23	1.38
San Antonio, Tex.	2.00	2.63	2.25	2.00	.97	.97	2.63	1.24	2.50	2.25	2.25	2.25	2.50	2.25	[23]1.75	1.75	2.38	2.38	[30]1.50	*	2.38	*	1.75	2.00	1.75	1.75	1.00
San Diego, Calif.	2.12	2.50	2.24	2.20	1.57	1.57	2.50	1.83	2.50	2.50	2.50	2.20	2.50	2.50	[24]2.10	2.00	2.50	2.50	2.04	2.04	2.25	*	2.07	2.07	2.12	2.32	1.65
San Francisco	2.23	[5]3.00	2.50	2.25	1.55	1.55	3.00	2.35	3.00	2.38	2.68	2.20	3.00	2.50	†2.15	2.08	2.50	2.50	2.25	†2.15	2.25	*	2.19	2.29	2.29	2.59	1.60
Santa Fe, N. Mex.	2.00	2.50	2.25	2.00	1.15	.75	2.50	1.45	2.50	.....	.....	2.00	2.00	2.25	2.00	1.75	2.50	2.25	1.38	.....	2.00	*	1.90	2.00	1.90	2.35	1.55
Seattle, Wash.	2.20	3.00	2.40	2.20	1.80	1.83	2.50	2.05	2.50	2.25	2.25	2.20	2.40	2.40	2.20	2.08	2.50	2.50	2.20	2.20	2.35	2.43	2.33	2.33	2.28	2.63	[f]2.38
Springfield, Ill.	2.25	2.75	2.40	2.40	1.60	1.60	2.75	1.70	2.63	2.75	2.50	2.13	2.25	2.38	2.00	2.13	2.50	2.50	2.20	2.20	2.25	.....	1.95	2.35	.....	2.35	1.65
Springfield, Mass.	2.00	2.50	2.45	2.45	1.40	1.60	2.50	1.63	2.50	2.50	2.50	2.50	2.23	2.35	2.00	2.00	2.35	2.35	2.00	2.20	2.20	2.20	1.83	1.83	1.75	2.28	.....
Tacoma, Wash.	2.19	2.50	2.39	2.19	1.81	1.81	2.50	1.81	2.55	2.40	2.40	2.31	2.45	2.40	2.19	2.01	2.50	2.50	2.19	2.19	2.34	*	2.33	2.33	2.28	2.63	1.93
Toledo, Ohio	2.30	2.60	2.50	2.31	1.70	1.70	2.60	1.82	2.50	2.60	2.50	2.50	2.50	2.50	[25]2.15	1.80	2.50	2.50	2.25	2.50	2.25	*	[43]2.38	[43]2.38	[50]2.25	[51]2.50	1.58
Topeka, Kans.	1.75	2.50	2.30	2.18	1.10	1.10	2.50	1.15	2.25	2.50	2.50	1.97	2.00	2.15	1.65	1.65	2.25	2.25	1.70	2.25	2.00	*	1.75	2.00	1.65	2.00	[M]1.30
Trenton, N. J.	2.75	2.75	3.00	3.00	1.70	1.70	2.75	1.70	2.75	2.75	2.75	2.75	2.65	3.00	2.25	2.24	2.75	2.75	2.50	2.50	2.75	[m]3.00	3.00	3.00	2.25	3.00	1.50
Tulsa, Okla.	2.25	3.00	2.13	2.13	1.30	1.30	3.00	1.45	2.50	2.50	2.50	2.50	3.00	2.40	2.00	2.00	2.50	2.44	1.60	.....	2.13	*	1.75	2.00	.....	2.00	1.50
Wilmington, Del.	2.25	2.75	2.80	2.40	1.30	1.55	2.50	1.55	2.75	2.50	2.25	2.25	2.50	2.50	[26]2.05	2.19	2.40	2.40	[30]2.28	.....	2.50	.....	2.90	2.90	2.75	3.15	1.50
Youngstown, O.	2.25	2.62	2.37	2.37	1.55	1.65	2.62	1.65	2.50	2.12	2.12	2.25	2.50	2.38	[27]2.12	2.23	2.38	2.38	2.26	.....	2.25	2.38	2.26	.....	.....	2.43	1.63

NOTE: Rates rounded to nearest cent * Same as craft doing work † 7-hr day # 6-hr day § Negotiating new rate ** Apprentice rate % basis [1] $2 eff 4/50, 2-yr contr [2] $2.10 on 5/50 [3] Negotiating for $1.75 [4] $2.25 on houses incl 5¢ vacation allow [5] Official, $2.75-$3 paid [6] Incl 2% welfare [7] Incl 3% vacation stamps [8] Incl cost of living allow [9] $2.75 on 6/50 [10] Negotiating for 10-15% raise [11] Structl fld is $1.55 [12] Machine, $2.05 hand [13] Mostly non-union at $1.50 [14] Arbitrating $2.25 [15] Inc 2% vacation allow [16] Brush. Spray $3.70, steel $2.10 [17] House. Steel $1.90 [18] Brush. Spray $2.63 [19] House. Comml $2.25 [20] Brush. Spray $2.33, steel $2.21 [21] Brooklyn $2.50, Queens $2.55 [22] Comm'l and ind $2.75 [23] Asking $2 on 3/50 [24] Brush. Spray $2.65, steel $2.35 [25] Brush. Spray $2.40 [26] Brush. Steel $2.23 [27] Brush [28] $18/da [29] $2.813 Brooklyn & Queens [30] Composition [31] Slate & tile [32] Spray [33] For heavy construction. Bldg. work* [34] Full time, broken time higher [35] $104/wk guartd [36] Light equip [37] Heavy equip [38] On bldgs [39] $2 on steel [40] Over 4 stories [41] $100/wk guartd [42] $110/wk guartd [43] $2.455 on 3/50 for roads, 5/50 for bldgs [44] Steel constr [45] $2 with attachments [46] Under 51 hp with power tk-of [47] Over 50 hp [48] Over 40 hp [49] $95/wk guartd [50] $2.325 3/50 on rd wk, 5/50 on bldg [51] $2.575 3/50 on rd wk, 5/50 on bldg [52] Heavy, $2 light [53] $125/wk [54] Over 3-ton [55] Under 2-ton [56] Heavy. $1.45 dump [57] Under 6-ton.

RANGES: [A] 0.75-0.80 [B] 0.75-0.85 [C] 0.75-0.88 [D] 0.85-1.00 [E] 0.85-1.25 [F] 0.86-1.18-1.50 [G] 0.88-0.95 [H] 1-1.25 [I] 1-1.50 [J] 1-1.75 [K] 1.10-1.30 [L] 1.15-1.25 [M] 1.20-1.30 [N] 1.25-1.50 [O] 1.25-1.63 [P] 1.25-1.68 [Q] 1.28-1.50 [R] 1.35-1.50 [S] 1.35-2.60 [T] 1.38-1.50 [U] 1.40-1.50 [V] 1.40-1.95 [W] 1.50-1.55 [X] 1.50-1.65 [Y] 1.50-1.75 [Z] 1.50-2 [a] 1.52-1.87 [b] 1.57-2.07 [c] 1.60-1.75 [d] 1.75-2 [e] 1.75-2.25 [f] 1.93-2.38 + 15¢ on cmt [g] 2.-2.25 [h] 2.25-2.50 [i] 2.28-2.70 [j] 2.34-2.40 [k] 2.50-2.60 [l] 2.50-3 [m] 2.75-3

Union wage rates in the building trades on July 1, 1949 ···

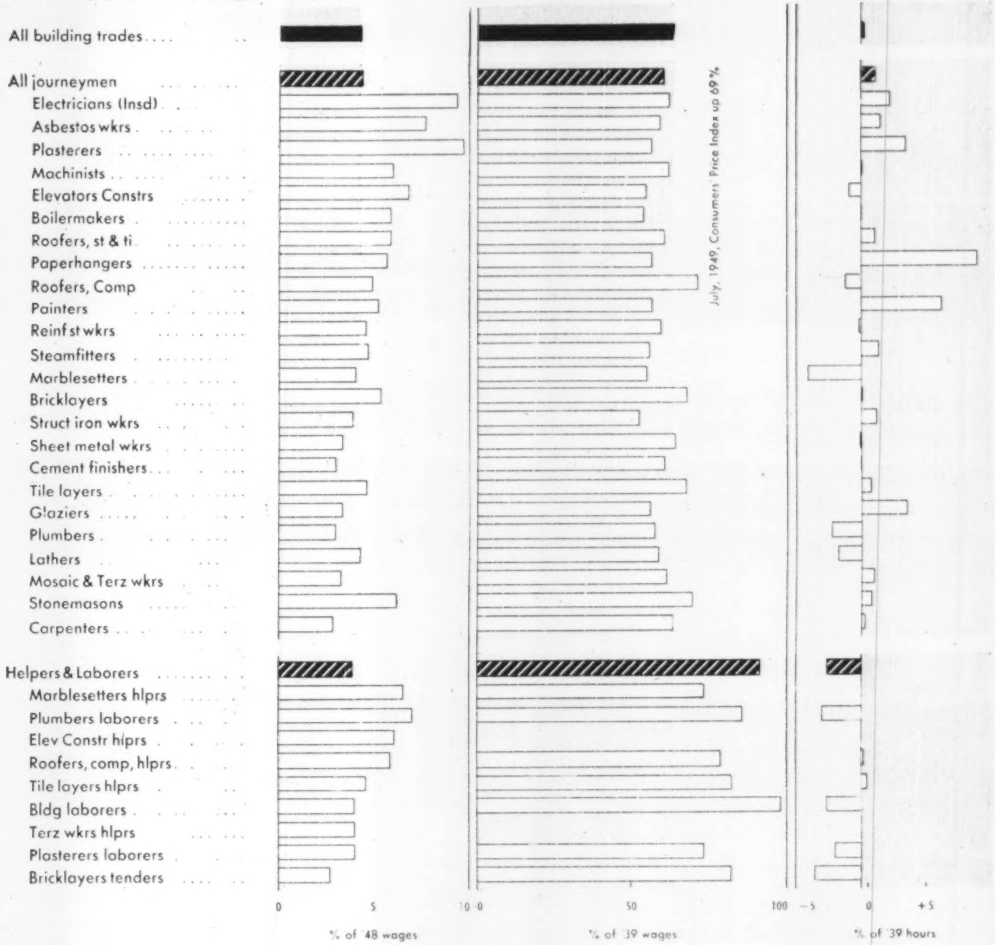


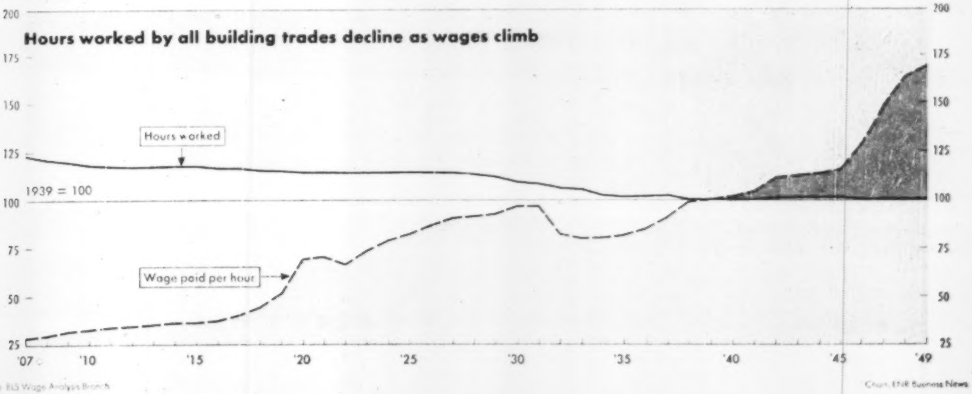


Data: BLS Wage Analysis Branch

Chart: ENR Business News

...reported by U. S. Bureau of Labor Statistics




Hours worked by all building trades decline as wages climb

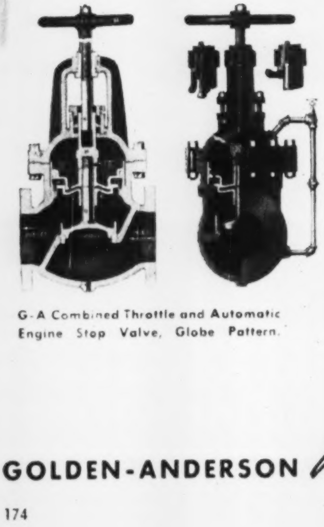
Data: BLS Wage Analysis Branch

Chart: ENR Business News

Positive Safety When Engine Turbines or Compressors Overspeed

GOLDEN-ANDERSON

throttle and automatic engine stop VALVES



G-A Combined Throttle and Automatic Engine Stop Valve, Globe Pattern.

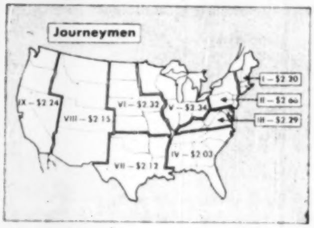
G-A Throttle and Automatic Engine Stop Valves give instant, automatic protection from damage when turbines, compressors or engines overspeed. Remote control system also permits valve operation from any station through a system of Solenoid Trip Pilot Valves. "Double Corliss" dashpot assembly effectively cushions the valve, preventing banging, chatter or spinning under any flow condition.

Valves are furnished extra heavy throughout, with the result that no distortion or warping is encountered under stress or strain. Available in standard or toggle yoke designs, angle, globe, elbow patterns. Let us work with you on any difficult Valve problem.

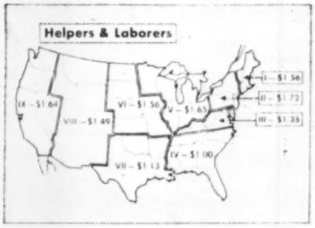
LIFE AND PROPERTY PROTECTION VALVES SINCE 1905

GOLDEN-ANDERSON *Valve* **SPECIALTY CO.** Keenan Building, Pittsburgh 22, Pa.

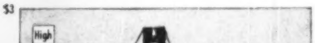
Wages are highest in Middle Atlantic states



Lowest in Southeast



Higher in larger cities



Except for Newark, N. J., which holds the distinction of having the highest wage rates of any city of any size in the United States, union rates for construction labor in general average less in the smaller population concentrations. The lowest average rate reported for journeymen in this BLS study is in York, Pa., $1.77, for laborers and helpers, in Charleston, S. Car., $0.787.

Average Union Wage Rates in Building Trades by Regions, July 1, 1949

Trade	United States	I New England	II Middle Atlantic	III Border States	IV South-east	V Great Lakes	VI Middle West	VII South-west	VIII Moun-tain	IX Pacific
All bldg trades	$2.18	$2.06	$2.45	$2.08	$1.84	$2.22	$2.15	$1.89	$1.90	$2.14
Journeymen	2.34	2.20	2.66	2.29	2.03	2.34	2.32	2.12	2.15	2.24
Electric'ns (Insd)	2.49	2.34	2.34	2.32	2.21	2.45	2.41	2.29	2.26	2.46
Asbestos wkrs	2.37	2.40	2.62	2.23	2.10	2.35	2.33	2.25	2.13	2.29
Plasterers	2.67	2.59	3.05	2.62	2.32	2.56	2.55	2.49	2.48	2.63
Machinists	2.39	2.25	2.55	2.28	2.22	2.42	2.36	2.25	2.07	2.38
Elevator constrs	2.45	2.36	2.62	2.60	2.34	2.35	2.42	2.36	2.22	2.48
Boilermakers	2.39	2.45	2.63	2.25	2.25	2.37	2.29	2.25	2.32	2.35
Roofers, sl & ti	2.24	2.30	2.73	2.15	1.79	2.35	1.96	1.77	2.02	2.21
Paperhangers	2.14	1.75	2.13	1.82	1.98	2.25	2.14	1.84	2.04	2.15
Roofers, comp	2.19	2.24	2.47	1.82	1.67	2.25	2.19	1.78	1.97	2.23
Painters	2.19	1.97	2.37	2.00	1.87	2.22	2.16	1.91	2.00	2.18
Reinf st wkrs	2.27	2.36	2.59	2.25	1.97	2.32	2.40	2.00	2.07	2.16
Steamfitters	2.46	2.33	2.67	2.30	2.29	2.43	2.42	2.30	2.29	2.46
Marblesetters	2.46	2.32	2.62	2.54	2.39	2.35	2.39	2.36	2.37	2.39
Bricklayers	2.74	2.52	3.06	2.84	2.46	2.53	2.70	2.58	2.84	2.77
Struct iron wkrs	2.42	2.39	2.73	2.48	2.15	2.37	2.32	2.19	2.08	2.32
Sheet met wkrs	2.29	2.36	2.58	2.24	1.95	2.22	2.31	2.20	2.06	2.22
Cement finishers	2.27	2.47	2.59	2.10	1.97	2.27	2.33	2.04	2.12	2.16
Tile layers	2.49	2.35	2.66	2.37	2.34	2.38	2.39	2.29	2.48	2.54
Glaziers	2.14	2.03	2.44	2.10	1.83	2.22	2.22	1.79	1.87	1.97
Plumbers	2.52	2.35	2.81	2.37	2.36	2.42	2.42	2.31	2.30	2.49
Lathers	2.54	2.61	2.75	2.50	2.29	2.48	2.35	2.59	2.46	2.41
Mosaic & terz wkrs	2.42	2.26	2.66	2.37	2.39	2.30	2.41	2.26	2.58	2.32
Stonemasons	2.66	2.56	2.85	2.89	2.47	2.37	2.56	2.59	2.71	2.73
Carpenters	2.25	2.00	2.62	2.20	1.90	2.32	2.25	1.99	2.03	2.11
Helpers & labor'rs	1.55	1.56	1.72	1.35	1.00	1.65	1.56	1.13	1.49	1.64
Plumbers laborers	1.64	......	1.69	1.39	1.05	1.72	1.74	1.05	1.66	1.74
Elev constr hlprs	1.73	1.66	1.88	1.76	1.63	1.65	1.73	1.65	1.54	1.75
Roofers, comp hlprs	1.31	1.68	1.46	1.45	.89	1.44	.....	1.05	.....	......
Tile layers, hlprs	1.93	1.68	2.08	1.69	1.02	1.77	1.63	1.27	1.67	1.86
Bldg laborers	1.47	1.54	1.59	1.32	.95	1.60	1.48	1.06	1.40	1.56
Terz wkrs hlprs	1.86	1.66	2.06	1.59	1.05	1.86	1.62	1.25	1.51	1.85
Plasterers, laborers	1.80	1.69	2.02	1.56	1.14	1.87	1.78	1.29	1.78	2.20
Bricklayers, tenders	1.68	1.56	1.88	1.43	1.02	1.71	1.64	1.31	1.74	1.93

Union labor trends reported by US Bu of Labor Statistics

Wage rates per hour—Index, 1939 = 100

Year	All Building Trades	Journeymen	Helpers & Laborers	Bricklayers	Carpenters	Cement Finishers	Electricians (Inside Wiring)	Glaziers	Lathers	Painters	Plasterers	Plumbers & Gas Fitters	Sheet Metal Workers	Steam & Sprinkler Fitters	Stonemasons	Structural Ironworkers	Building Laborers	Bricklayers' Tenders
907	29.3	29.7	27.3	37.7	29.8	34.5	27.9	.....	.....	26.2	37.3	33.3	30.6	30.1	33.9	27.9	30.8	30.3
913	36.1	36.9	31.8	41.5	36.8	38.0	33.8	.....	34.6	35.5	39.3	37.9	35.6	35.0	36.7	37.3	34.2	31.8
926	88.3	88.7	84.9	94.1	88.5	86.6	81.5	80.7	83.0	90.9	92.4	83.9	86.3	84.9	92.7	81.1	86.9	85.5
1930	97.0	97.5	93.3	101.8	96.9	95.4	90.9	92.6	89.6	100.6	98.1	91.5	94.7	93.5	99.1	92.5	92.9	94.9
1932	83.1	83.6	79.2	87.0	79.6	83.6	87.9	78.0	80.0	85.3	81.4	80.5	83.4	81.0	88.4	81.0	78.7	78.4
1938	99.3	99.3	99.2	99.5	99.8	99.6	99.5	99.3	96.8	99.2	99.2	99.1	98.6	99.3	99.7	98.9	99.4	99.7
1942	111.9	110.9	117.5	108.3	112.1	110.8	113.5	108.8	109.1	110.5	105.0	110.5	116.0	109.3	108.0	108.7	119.6	115.7
1946	129.3	126.8	146.3	125.6	129.7	128.2	124.9	123.4	124.2	127.3	119.0	123.2	133.0	124.6	126.5	121.4	152.2	141.7
1947	147.9	144.6	171.1	145.2	149.6	144.3	140.9	141.9	144.4	142.4	139.3	142.9	146.8	139.1	145.0	136.3	177.9	165.6
1948	163.5	159.4	192.7	165.6	164.7	161.1	154.4	155.5	157.8	154.4	148.2	158.2	164.4	154.3	166.0	151.9	200.8	185.5
1949	170.3	166.1	199.8	174.0	169.1	165.8	168.1	160.5	164.2	162.1	161.9	162.8	169.6	161.3	175.7	157.4	208.4	190.4

Hours worked per week—Index, 1939 = 100

Year	All Building Trades	Journeymen	Helpers & Laborers	Bricklayers	Carpenters	Cement Finishers	Electricians (Inside Wiring)	Glaziers	Lathers	Painters	Plasterers	Plumbers & Gas Fitters	Sheet Metal Workers	Steam & Sprinkler Fitters	Stonemasons	Structural Ironworkers	Building Laborers	Bricklayers' Tenders
1907	124.3	123.8	126.1	122.9	121.0	122.7	124.2	.....	.....	133.1	125.8	120.6	117.0	120.3	118.4	121.3	121.6	118.9
1913	118.2	118.0	118.3	114.9	115.6	119.8	120.7	.....	121.8	125.9	124.3	119.2	114.9	118.0	115.7	114.1	118.3	116.0
1926	114.9	115.1	113.9	113.3	113.5	113.4	115.9	117.5	118.9	120.7	118.2	116.5	111.8	114.4	114.5	112.8	112.1	113.9
1930	109.8	110.0	109.0	107.1	109.4	108.1	109.9	112.4	110.4	115.4	113.0	109.9	106.9	108.5	107.1	108.8	110.0	106.9
1932	106.5	106.6	105.7	103.1	105.0	105.6	106.2	107.9	109.3	114.2	110.1	108.0	103.6	106.4	104.8	104.8	104.9	104.0
1938	100.2	100.1	100.2	99.0	100.0	100.0	100.3	100.2	100.8	110.4	100.0	99.7	100.0	99.6	100.1	100.1	100.1	100.3
1942	101.1	101.8	98.8	100.8	100.8	100.6	104.6	102.0	102.5	106.5	102.0	99.9	100.9	102.2	100.2	101.1	98.8	98.6
1946	100.2	101.1	97.4	100.3	100.3	100.4	100.5	102.0	102.2	106.1	104.1	98.3	100.8	101.3	100.0	101.1	97.2	96.9
1947	100.1	100.9	97.4	99.8	100.2	100.0	100.5	103.5	102.2	106.2	103.0	97.3	100.1	101.3	99.3	101.1	97.2	96.4
1948	100.1	101.0	97.3	100.5	100.2	100.0	100.5	103.5	98.1	106.2	102.9	97.6	100.1	101.3	101.0	101.1	97.2	96.4
1949	100.2	101.1	97.3	100.1	100.2	100.0	107.2	103.5	98.1	106.2	103.5	97.6	99.9	101.3	100.8	101.1	97.2	96.4

Average Wage Increase in 85 Cities— July 1, 1949, to Jan. 3, 1950

Trade	Per cent		¢ per hr		Rates, Jan. 3, 1950		
	3Q	4Q	3Q	4Q	Low	Aver	High
Bricklayers	0.4	0.3	1.2	0.7	$2.13	$2.76	$3.25
Carpenters	1.2	...	2.8	.1	1.63	2.28	3.00
Electricians	.6	.4	1.6	1.0	1.83	2.51	3.00
Painters	.4	.2	.9	.5	1.38	2.20	2.50
Plasterers	.3	.2	.8	.5	2.00	2.68	3.25
Plumbers	.5	.4	1.2	1.1	1.90	2.54	3.00
Building laborers	1.5	.2	2.2	.3	.75	1.49	2.13

Since July 1, 1949, when union wage rates and hours were analyzed in the detail reported in these pages, the averages have changed very little. A maximum of 1.7%, and that an increase for building laborers, shows in the BLS quarterly report for 85 cities for January, 1950. The seven trades analyzed are shown in the accompanying table with averages for 1950.

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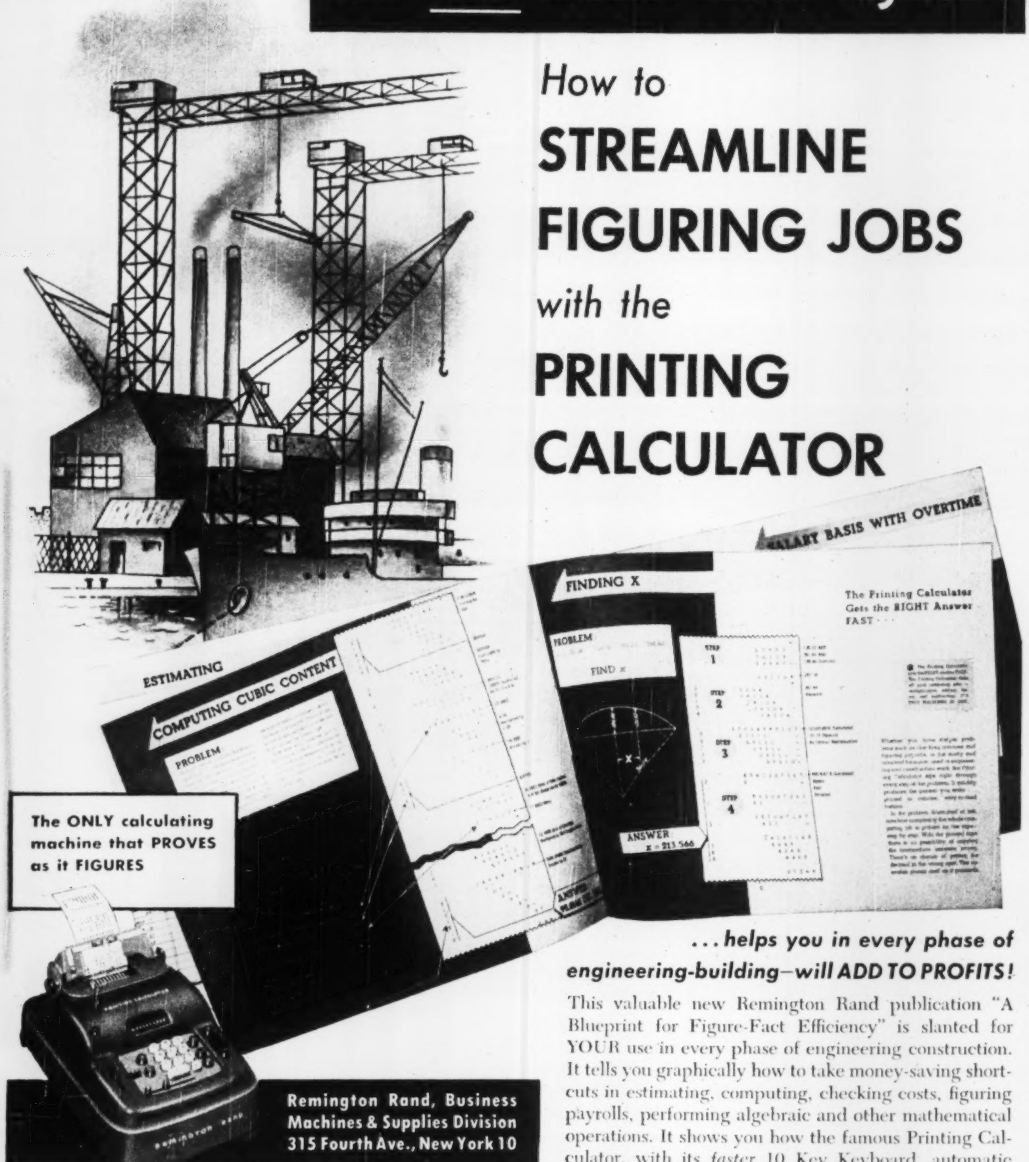
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Minimum wages set for operators of construction equipment

Minimum wage rates outside cities for construction equipment operators show an even wider variance of terminology than that illustrated in the accompanying table. These rates have been condensed from 168 categories of equipment operators and 80 classifications of truck drivers, on 11 projects plus those in Texas.

Operators	State	$/hr.
Boring machine	Wyo.	$1.70
Burner man on dryer	Wash.	1.80
Cement hog, Fuller-Kenyon pump & similar equip.	Calif. Wash.	2.34 1.90
Generating plant, engr	Ariz.	1.85
Form, jumbo	N. Mex.	2.00
Grout machine	Wyo.	1.85
Heaters, surf ... Ariz. $2.08,	Calif.	2.29
tank car	Wash.	1.75
Highlift	N. Mex.	2.00
Handi-crane (no oiler req.)	Calif.	2.34
Central mixing plant	Ark.	1.75
Pugmill, wood mixer type	Calif.	2.34
Pugmixer or spreader box	Wash.	1.80
Pushcat	Ark.	1.50
Retort	Wash.	1.80
Rotary power broom	Wash.	1.75
Scale	Ark.	1.50
Side boom	Ark.	1.75
Spreader machines (Barber Greene, Jaeger, etc.)	Calif.	2.29
Spreaders, asph. & concr.	Ariz.	2.03
Spreader, box driver	N. Mex.	1.35
Tailtower	Ark.	1.50
Tamper, machine	Ariz.	2.03
Tournadozer	Wyo.	2.00
Tournawagon	Wyo.	1.90
Tower excavator	Ark.	1.75
Traveling pipe wrapping & cleaning mach.	Ariz.	2.23
Truck, bull lifts to 5-T	Wyo.	1.60
over 5-T	Wyo.	1.80
oil under 2,500 gal.	Ariz.	1.70
2,500-7,000 gal.	Ariz.	1.83
7,000 gal. & over	Ariz.	1.95
tank,* 2,260 gal. or less	N. Mex.	1.30
over 2,260 gal.	N. Mex.	1.50

* Excludes trailer or semi-trailer.

Typical minimum wage rates prevailing in area

Construction equipment operators	Wage rates—$/hour—in							
	Ariz.	Ark.	Calif.	Colo.	Nebr.	N.Mex.	Wash.	Wyo.
Asphalt plants [a]firemen [b]paver	$1.93[a]	....	$1.94[a]	$2.00	....	$2.00	$2.00[b]	....
[c]mixerman [d]eng [e]engr $2.29	2.03[c]	....	1.99[c][e]	....	....	....	2.00[d]	....
Batch plants	....	....	2.00	....	....	2.00	2.00	....
Bulldozers	2.03	$1.75	....	2.00	$1.50	2.00	2.10	$2.00
Cableway, highline	2.15	2.00	2.59	....	....	....	2.35	2.15
Compressors, air, [f]only 1 mach [g]2 or more mach.	1.78	1.50[f]	1.94[f]	2.00	1.25	2.00	1.75[f]	2.00[g]
[h]under 315 cf	....	1.75[g]	2.24[g]	....	....	....	1.80[g]	1.65[h]
Cranes, derricks, draglines	2.23	2.00	2.44	2.15	1.70	....	2.35	2.15
Crushing plant [i]crusher	2.03	....	2.29[i]	2.00	....	2.00	2.00	2.00[i]
Distributors, [j]bitum [k]oil [l]leverman	....	1.50	1.60[k]	2.00[j]	1.50[j]	1.60	1.75[l]	1.75[k]
Drilling machy, incl well [m]earth driller $1.68	2.15	1.50[m]	2.29	....	....	2.00	2.10	2.00
Finish mach, mech [n]conc [o]concr or asph	2.03	1.50[o]	2.29[o]	2.00	....	2.00	1.90[n]	....
Graders, motor [p]blade, or tow blade	1.90[p]	1.68	2.44	2.00	1.50	....	2.15	....
elevating	2.15	1.75	2.34	....	....	2.00	2.15	2.00
Hoists, 1-drum [q]elevator [r]material	1.98[q]	1.68	2.19[r]	2.00	1.25	2.00	1.90	1.95
2- or more drum	....	1.75	....	2.15	1.25	2.10	2.10	1.95
Locomotives, engrs [s]excl. dinkey	2.15	1.75	2.04[s]	....	....	2.00	2.25	....
Dinky [t]steam over 30-T [u]also firemen	1.90	1.75	2.29[t]	....	....	....	1.85[u]	2.00
Mixers, concr. paving and/or mobile [v]on GC $2.35	2.13	1.75	2.34	....	....	....	2.15[v]	2.00
Mixers, concr. [w]skip type [x]1 cy & over [y]10-S & over	1.90[w]	1.75[y]	2.24[x]	2.15[x]	1.60	2.10[x]	1.90	1.80[w]
Under 1 cy [z]under 10-S	....	1.50[z]	1.94	2.00	....	2.00	....	
Motor patrol	2.15	1.75	2.44	....	....	2.00	....	2.00
Mucking machines	....	....	2.41	....	....	2.10	2.30	2.10
Pile drivers	2.23	2.00	....	....	....	2.10	2.35	2.15
Pumpcretes	1.90	1.75	2.24	....	....	2.00	2.10	2.00
Pumps [1]2"-4", 5"+ $1.68 [2]under 6", 6"+ $1.95	1.78	1.50[1]	1.94	2.00	....	2.00	1.75	1.80[2]
Rollers, [3]grade & surf [4]finish high type pave.	1.98	1.68	2.29	2.00	1.25	2.00	1.75[3]	1.80[3]
[5]asph, sheepfoot $1.50	....	1.75[5]	....	....	....	....	2.00[4]	1.95[4]
Ross carriers, lumber carriers	1.90	....	2.04	1.60	....	1.63	....	1.75
Scoopmobiles [6]hoist, as loader $2.34	....	....	2.19[6]	....	....	2.00	1.90	1.80
Scrapers [7]Bagley [8]single, tandem $2.15	2.03	1.75	....	2.00	1.50	2.00	1.80[7]	2.00[8]
Screedmen	1.78	....	1.94	....	....	....	....	....
Shovels [9]over ¾ cy, under $2., walking $2.50	2.23	2.00	2.44[C]	2.15	1.70	2.15[E]	2.35	2.15[9]
[A]drag type, [B]4-cy + [C]1-cy & under [D]over 1-cy	2.03[A]	....	2.59[D]	....	....	2.35[F]	2.70[B]	....
[E]under 3-cy [F]3-cy & over	....	....	....	....	....	....	....	....
Teamsters [X]2-up, for 4-up $1.40	1.45	....	1.58	1.20[X]	....	1.25	1.65	....
Tournapulls, Ferracobra & similar	....	1.50	2.44	2.00	....	2.00	2.10	2.15
Tractors [G]35-hp or less [H]over 35-hp [I]farm	2.03	....	2.29	1.45[G]	1.50	1.50[G]	2.10	1.40[I]
[J]push [K]wheel type [L]boom, tandem $2.59	1.90[K]	....	2.44[L]	2.00[H]	....	2.00[G]	1.75[K]	2.00[J]
Trenching machines	2.10	1.75	2.34	2.00	1.50	2.00	2.10	2.00
Truck drivers, under 3-T [M]5-T & under	....	1.00	....	....	1.10[M]	....	....	1.35
3-5-T, [N]5-T & over	....	1.15	....	....	1.25[N]	....	....	1.40
pick ups	....	....	1.58	....	....	1.05	1.60	1.50[N]
dump, under 4-cy [P]6-cy & under [V]Euclids	1.53	1.50[V]	1.58	1.40[P]	....	1.30	....	1.70[P]
4-8-cy [Q]6-8-cy [U]over 6-cy	1.55	....	1.67	1.50[U]	....	1.43	....	1.80[Q]
8-12-cy [O]8-14-cy & 14-18-cy	1.60	....	1.85[O]	1.60[V]	....	1.40	....	1.90
12-16-cy [R]12-20-cy [W]Botm dmp Euclid	1.68	....	1.92[O]	....	....	1.50	....	2.00[R]
16-cy & over [S]16-18-cy [T]18-cy & over	1.88	....	2.04[T]	....	....	1.63[S]	....	2.00[W]
20-cy & over	....	....	....	....	....	1.68	....	2.15
Dumpsters	1.88	1.25	1.67	....	....	1.65	....	....
Dumptors [Y]6.9-cy or less, 7-15.9-cy $1.78, 16-cy + $1.88	1.65[Y]	....	....	1.60	....	....	1.80	....
Flatbed [Z]with pwr takeoff $1.85	....	....	1.60[1]	1.40	....	1.35	1.60[Z]	....
[1]under 18,000 lb [2]over 18,000 lb [4]Lowboy, lgt	....	....	1.73[2]	....	....	1.65[4]	....	....
Semi-trailer [3]Low bed [5]Lowboy, hvy	....	....	....	1.80	....	2.00[5]	1.75[3]	....
& trailer and heavy duty transports	....	....	....	1.60	....	1.55	1.75	....
Transit-mix [6]under 3-cy, over $1.88 Ariz., $1.85 Wash	1.75[6]	....	....	....	....	1.60	1.75[6]	....
Waterwagon [7]1600 gal. & under, over $1.70 [8]under 2500 gal	1.58	....	....	....	....	....	1.60[7]	....
2,500-7,000 gal. [9]over 7,000 gal $1.83	1.70[9]	....	....	....	....	....	....	....

MINIMUM WAGES set by the U. S. Secretary of Labor in accordance with the Davis Bacon Act (as amended) for the following projects to be built for the U. S. Bureau of Reclamation, Department of Interior:

ARIZ—Gila Project, Dec. 1949, ARK—Blakely Mtn Dam, Garland Co., Dec. 1949, CALIF—Shasta Power Plant, Central Valley Project, Jan. 1950; COLO—Fire Mtn Canal, Paonia Project and Colo—Big Thompson, Jan. 1950; NEBR—Superior Canal, Missouri River Basin Project, Jan. 1950, N. MEX—Fort Sumner Diversion Dam, Mar. 1950; WASH—Columbia Basin Project, Ephrata, and Grand Coulee Dam (GC), Nov. 1949; WYO—earthwork, tunnel and Shoshone Power Plant access road, Shoshone Project.

Texas minimum wage rates set for three areas

The Texas Highway Commission has set minimum wage rates in all contract projects beginning with February, 1950, lettings which also became effective February 1, 1950, on all day labor construction projects. These minimum rates for construction equipment operators only are quoted here.

The three groups for which these rates apply are based on Texas Highway Department Districts:

Group I covers districts 6, 8, 20, 24, Tarrant Co. in 2, Harris, Fort Bend, Brazoria, Matagorda and Galvaston Cos. in 12 and Dallas Co. in 18.

Group II covers districts 1, 2 (except Tarrant Co.), 3, 5, 7, 9, 10, 11, 14, 15, 18 (except Dallas Co.), 19 and 25.

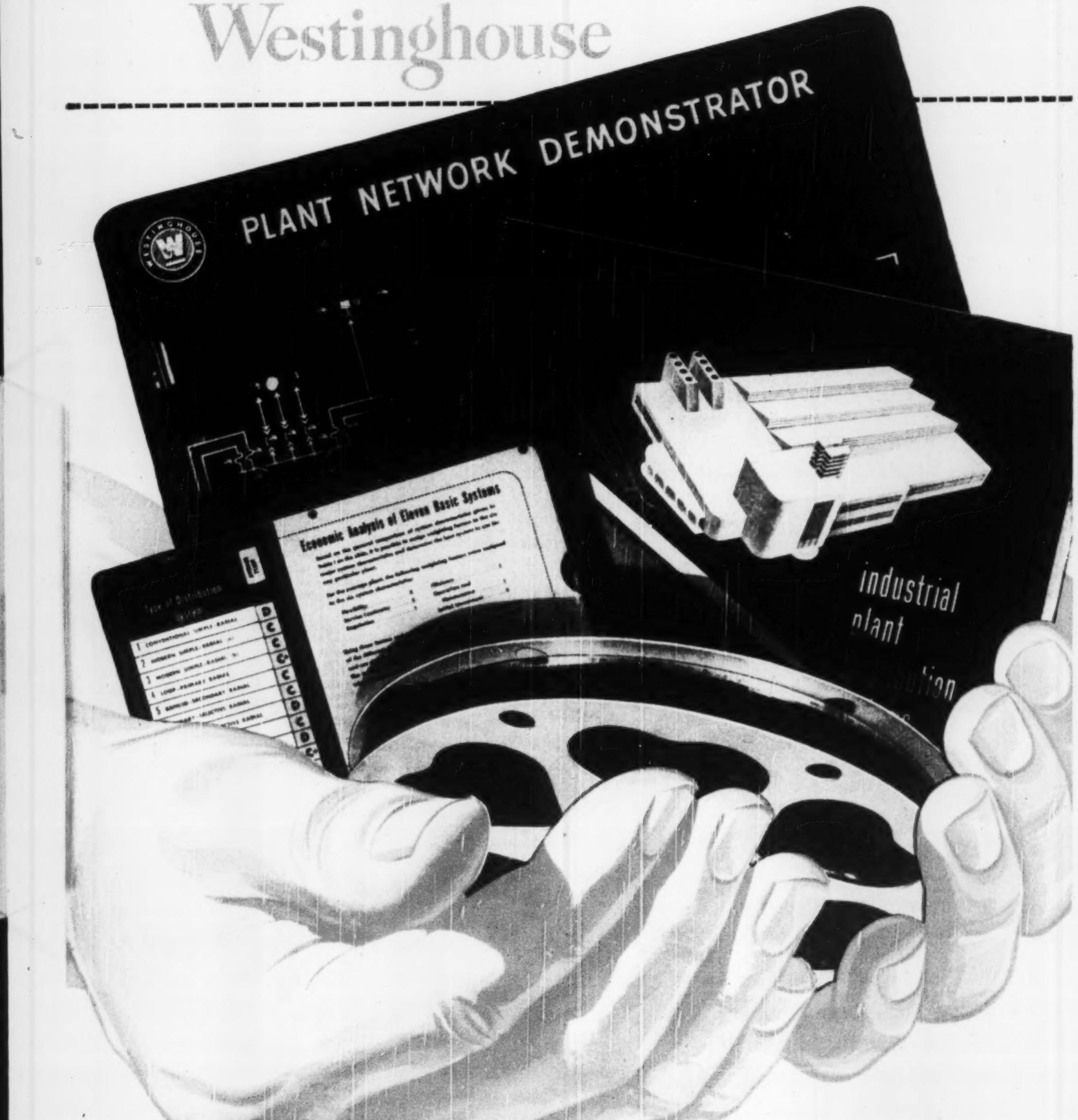
Group III covers districts 4, 13, 16, 17, 21, 22, 23 and Waller, Austin and Montgomery Co. of 12.

Where a project overlaps two groups rates paid shall not be less than those for the group in which the greater portion of the length is located.

Construction equipment operators, skilled	Hourly wage rates Gr I	 Gr II	 Gr III
Asphalt plant mixer	$1.35	$1.25	$1.15
Concrete batch plant	1.35	1.25	1.15
Crane, ¾ cy & over	1.60	1.50	1.40
Crane, under ¾ cy	1.50	1.375	1.25
Crusher, 40-T/hr & up	1.50	1.375	1.25
Dozer, tractor over 55 hp	1.50	1.375	1.25
Dragline ¾ cy & over	1.55	1.45	1.35
Dragline under ¾ cy	1.50	1.375	1.25
Elevating grader	1.50	1.375	1.25
Hoisting engr, 2-dr or more	1.50	1.375	1.25
Mechanic	1.50	1.375	1.25
Motor patrol, finish pave & bases	1.55	1.45	1.35
Paver, 27-E or over	1.60	1.50	1.375
Pile Driver	1.55	1.45	1.35
Power shovel, ¾ cy or over	1.625	1.50	1.40
Power shovel, under ¾ cy	1.50	1.375	1.25
Roller, self-proplld, finish pave, surf.	1.35	1.25	1.15
Scraper, over 7 cy	1.50	1.375	1.25
Stabilizing plant	1.45	1.35	1.25
Operators, intermediate			
Air tool	1.05	.95	.85
Blade grader	1.25	1.125	1.00
Concrete spreader	1.25	1.125	1.00
Crusher, under 40 T/hr	1.15	1.05	.95
Distributor, driver	1.15	1.05	.95
Distributor, operator	1.20	1.10	1.00
Dozer, tractors under 55 hp	1.20	1.10	1.00
Finish mach, concr. or asph	1.25	1.125	1.00
Flexplane	1.25	1.125	1.00
Form grader	1.125	1.00	.90
Hoist	1.20	1.10	1.00
Loader	1.10	1.00	.90
Mech. longitudinal float	1.25	1.125	1.00
Mixer, less than 27-E	1.10	1.00	.90
Motor patrol	1.25	1.125	1.00
Pump man	1.00	.90	.80
Roller, self-propelled	1.10	1.00	.90
Scraper, 7 cy & under	1.15	1.05	.95
Screen and/or washing plant	1.10	1.00	.90
Spreader box	1.05	.95	.85
Subgrader	1.10	1.00	.90
Teamster 4-up or more	1.00	.90	.80
Tractor, 20 hp or more	1.10	1.00	.90
Trenching machine	1.10	1.00	.90
Truck driver, over 1½ T	1.00	.90	.80
Wagon drill	1.10	1.00	.90
Operators, unskilled			
Concrete vibrator	.85	.75	.75
Teamster, 2-line, Morman, fresno, wheeler, wagon, etc	.85	.75	.75
Tractor, under 20 hp	.85	.75	.75
Truck driver, 1½ T or less	.85	.75	.75

YOU CAN BE **SURE**.. IF IT'S

Westinghouse


PLANT NETWORK DEMONSTRATOR
WESTINGHOUSE
Economic Analysis of Eleven Basic Systems
Type of Distribution System
1 CONVENTIONAL SIMPLE-RADIAL
2 MODERN SIMPLE-RADIAL
3 MODERN SIMPLE-RADIAL
4 LOOP-PRIMARY RADIAL
5 BANKED SECONDARY RADIAL
industrial
plant

REAL HELP!

...FOR YOUR POWER SYSTEM PLANNING

Designing a new plant? Expanding an old one? Changing production lines? If so, *have you planned the power distribution system?*

The success of the new production areas depends on this planning. Choose the "one best system" for the plant you're designing. And before you choose . . . get the complete story on modern *system planning.*

Make money-saving decisions. See why initial cost is a minor factor. Choose the system with the lowest *long-range* cost . . . the one that will *really* save money for your client. Be sure it will handle present AND future loads.

Selecting such a system can be easy! Our engineers have met and answered power distribution problems for *all* types of industries. This broad experience is available to help you adapt distribution systems to the plants you're designing.

And as a further service, we've prepared this valuable information in the form of . . .

- **A New 34-Page Booklet:** "Industrial Plant Distribution Systems", B-4045. Fact-filled pages and colorful diagrams completely explain the eleven basic systems most widely used in industry today. It will provide answers to many of your problems that have gone unsolved.
- **A System Selector:** A wealth of information condensed to a pocket-sized selector. In a matter of minutes you can make preliminary decisions on the system that best answers the requirements *you're* got to meet.
- **A Full-Color Movie:** Get all the facts visually! This 16-mm sound movie is a 20-minute dramatization that will clearly point the way to new economies in plant power distribution. Ask your Westinghouse representative for a free showing. No obligation, of course.
- **A Network Demonstrator:** Operating display for meetings shows how a plant network system actually works—and what it does—under any load condition. Find out from your Westinghouse representative when there will be a demonstration in your area.

Get this key information on system planning NOW. Call your nearest Westinghouse office. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna. J-94790-A

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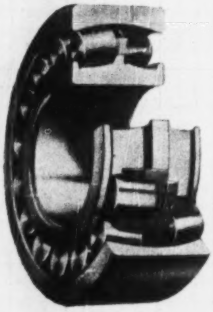
SYSTEM PLANNING SERVICE

crushing big ones into little ones with
TORRINGTON SPHERICAL ROLLER BEARINGS



460 shock impacts per minute are absorbed by Torrington Spherical Roller Bearings as they help Barber-Greene Ebersol jaw crushers size rock to specifications.

Extreme overloads are handled with ease by these heavy-duty bearings. Because they are freely self-aligning, they maintain full roller-to-race contact for sustained capacity despite shaft deflections under shock loads.

To make sure of outstanding bearing performance in your application, call on our engineers to help you select and apply Torrington Bearings.

THE TORRINGTON COMPANY
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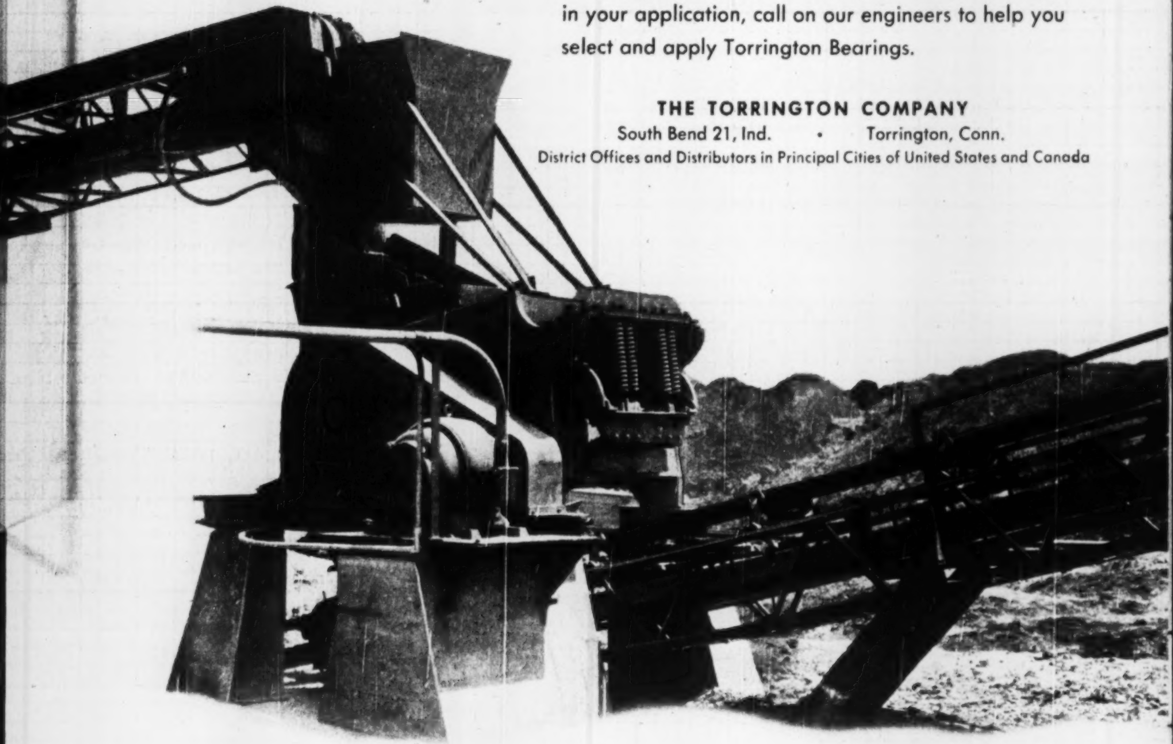


TORRINGTON *SPHERICAL ROLLER* **BEARINGS**

SPHERICAL ROLLER • TAPERED ROLLER • STRAIGHT ROLLER • NEEDLE • BALL • NEEDLE ROLLERS

Compensation insurance rates for state plans

Compensation must be insured in a monopolistic state fund in five states, Nevada, North Dakota, Ohio, West Virginia and Wyoming. For Ohio, rates are shown in the accompanying table of rates in all other states.

In the other four state fund states, the rate structures do not adapt themselves to the tabulation. These are reported as follows:

NEVADA

Special Construction Schedule, Effective July 1, 1947, still operative Mar. 1, 1950

Type of Construction	Rate Per $100 of Payroll	Total**
Street or Road.	All operations not under direct supervision of State Highway Dept. or municipal authorities (excl. tunnels and bridges over 50 ft.)	$4.80
Railroad.	All operations incl. bridges under 50 ft.; excl. bridges over 50 ft. and tunnels	4.80
Tunnels.	All work including lining	6.40
Tunnels, Shafts and Galleries exceeding 7 ft. in diam.	All work to completion, incl. lining	8.00
Bridges.	Wood, metal or concr. over 50 ft	6.40
Dam.	Earth, rock or concr. All operations where height or length of structure exceeds 75 ft.; incl. excav., quarrying, jetty and breakwater constr. and pile driving, power plants and appurtenant wks., incl. gravel crushing plants. Pay roll to incl. employees engaged in making, setting up and taking down forms, scaffolds, false work and material distributing apparatus, shops, garages, railroad operations and other allied activities	6.40
Building.	Brick, lumber or concr. not exceeding three stories, incl. carpentry, plastering, painting and electr. instal	4.00
Sewer.	All operations (excl. tunneling except at street crossings)	4.00
Water Mains and Connections.	(Excl. tunneling except at street crossings)	4.00
New Plant.	Incl. install. of machy	6.40
Building.	Moving or wrecking	6.40
Concr. Sidewalks, Curbs and Gutters.	(No payroll division) Incl. sand and gravel pit operations and transportation of material (no blasting)	4.00
Excavation.	For cellars, bldg. fdns and other	4.00
Iron or Steel Erection		6.40
Steel Towers, Tanks, etc		6.40
Commissary.	Cooks, waiters and other employees engaged in furnishing boards for employees in connection with contracting risks	1.60
Timekeepers		1.60
Clerical.	Strictly office employees. Not exposed to transportation or other general hazards of operations	.40

**Distribution: Compensation, 62½%, accident benefits and occupational diseases, 37½%

Where an industry, establishment or work embraces activities separately classified under this Schedule of Rates, and where the employees of such industry, establishment or work are interchangeable, the premium rate applicable to such industry, establishment or work shall be the rate applied to that portion of the business that carries the highest general hazard rate, unless by request of the employer, or by action of the Commission, a general rate is established that will more nearly reflect the general hazard of that particular undertaking as a whole.

Should rates be desired on any undertaking not specified in the foregoing schedule, they will be quoted on request.

NORTH DAKOTA

Effective July 1, 1949, Rate per $100 Payroll

Type of Construction	Basic	Min. Prem.	*B.C.A. Factor
2803 **Carpentry shop**	$1.95	$8.85	$1,560
3060 **Sheet metal fabr.**, install. and erect	1.35	7.05	1,080
3107 **Blacksmithing**	2.20	9.60	1,760
5025 **Masonry** work (N.O.C.†) (In sewers, see 6301)	2.25	9.75	1,800
5040 **Bridges** (over 25 ft.), erect. and paint. of struct. iron and steel, lightning rods, radio equip., windmills, iron work, balconies, fire escapes, railings, staircases and coal chutes outside of bldgs	14.50	46.50	11,600
5100 **Erect. orn, brass, bronze, and iron work** within bldgs.; mill wrighting, erect. and repair. machy.; install. of steam boilers, incl. constr. of neces. concr. or masonry fdns	2.50	10.50	2,000
5183 **Plumbing, gas, steam, hot water and other pipe fitting,** incl. house connections. Shop payroll, if any must be included	1.50	7.50	1,200
5190 **Install. of elec. equip.** in bldgs., exclusively, incl. broadcasting eng. and mechanics, install. and erect. within doors, and the making of service connections but excl. the erect. of dynamos and equip. in power plants	1.30	6.90	1,040
5205 **Concr. constr.** (excl. concr. bridges and culverts under 25 ft.). Payroll to incl. employees engaged in making, setting up and taking down forms, scaffolds, false work and operating concr. mixing or distrib. apparatus	4.50	16.50	3,600
5345 **Plastering,** the erect. of plaster boards, plaster block, and incl. stuccoing	3.00	12.00	2,400
5410 **Carpentry**	3.00	12.00	2,400
5462 **Glaziers** away from shop	3.50	13.50	2,800
5474 **Painting and decorating** (excl. paint. of steel struct. and bridges)	2.50	10.50	2,000
5502 **Constr. of concr. floors,** not reinf. or selfbearing, incl. tile floors, wainscoting and interior decorating	1.50	7.50	1,200
5545 **Roofing** (N.O.C.†)	6.00	21.00	4,800
5602 **Alterations and repair of insured's exist'g bldgs. and plants,** excl. erect. or demolition of struct. steel or the constr. of sewers, tunnels, shafts or subways. (This classification not applicable to contractors)	1.50	7.50	1,200
5603 **Consult. engrs. and archts.,** superv. only	.30	5.00	240
5700 **Building, wrecking, raising and moving**	12.00	39.00	9,600
6003 **Piledriving**	7.75	26.25	6,200
6042 ‡**Street and road constr.** (no quarrying), incl. incidental culverts and single span bridges not over 25 ft., paving, street cleaning, sand and gravel excav	2.70	11.10	2,160
6200 **Well drilling**	5.00	18.00	4,000
6221 **Excav., cellars and fdns.** for bldg., retain. walls, Incl. grading prep. to bldg. erect. (No dredging)	$3.50	$13.50	$2,800
6223 **Dredging** by floating dredges	7.50	25.50	6,000
6230 **Earth-fill dam construction**	4.00	15.00	3,200
6231 **Concrete construction** for dams	4.50	16.50	3,600
6232 **Piledriving and steel sheet piling** for dam construction	7.75	26.25	6,200
6233 **Tunnel construction** for dams	8.00	27.00	6,400
6251 **Tunneling,** incl. all work to completion	8.00	27.00	6,400
6253 **Caisson work** for bldgs. and bridge fdns. Payroll to incl. all employees working under air pressure	18.00	57.00	14,400
6301 **Sewer building,** no blasting or tunneling	10.00	33.00	8,000
6319 **Laying of steam, water or gas mains** and connections	3.75	14.25	3,000
6325 **Conduit construction**	2.75	11.25	2,200
6400 **Constr. of fences** of wood, stone, metal or concr. not over 6 ft. high	1.75	8.25	1,400
7534 **Electric light and power line constr.**, incl. erect. of poles (No payroll division)	6.50	22.50	5,200
7535 **Electr. apparatus-install. and repair,** excl. erect. of poles and stringing of wires. No payroll division with electric light and power companies	2.50	10.50	2,000
7590 **Garbage works,** reduction or incineration of garbage	2.00	9.00	1,600
9403 **Garbage, refuse and ash collecting**	2.00	9.00	1,600

*Basic Compensation Allowance. †Not otherwise classified. ‡Rate named for this classification does not contemplate sawmill logging, timber cutting, etc., operations.

WEST VIRGINIA

Effective July 1, 1949, Rate per $100 of Total Gross Earnings of all Employees

Class of Construction	Base†	Class of Construction	Base†
B-4 Wood Working	$2.50	L-15 Bldg. Constr. and Repairs	$2.00
C-1 Clay, Sand and Gravel	4.00	L-22 Street and Road Constr.	4.38
F-3 Municipalities	1.62	L-30 Plumbing	1.25
F-4 State and County Depts.	1.25	L-47 Locks, Dams, Bridge Constr.	5.00
F-5 State Road Comm.	1.25	L-49 Trucking, Heavy Hauling	3.13
L-1 Tunneling and Excav.	4.38	L-54 Steel Erect. Not otherwise class.	5.00
L-4 Structural Steel Erect.	10.00	P-7 Clerical Office Employees	.20
L-11 Electric Lines Constr.	3.13	P-8 Salesmen and Engineers	.38

†Loading, 15% of Base: Min., 40% of Base: Max., 200% of Base. New subscribers are charged base rate plus 20% loading, additional 5% being for catastrophe.

WYOMING

Effective 1947, still operative Mar. 1, 1950

Provisions of the Workmen's Compensation Law Relating to Payment of Monthly Premiums include:

1. **Administration Fee**—Every employer who shall engage in any of the extra-hazardous occupations defined in the Workmen's Compensation Act, and who has not theretofore made any payment into the Industrial Accident Fund, shall pay an administration fee of $10.00 at the time of commencing employment to establish an account in the fund.

2. **Monthly Reports**—A signed statement of the total gross earnings (before Social Security or Withholding Tax or any other deductions) accrued to employees must be filed in the office of the State Treasurer on or before the 15th day of the month for the previous calendar month's payroll, by each employer coming under the provisions of the Workmen's Compensation Act. Names of all employees in extra-hazardous occupations as defined in the Act, must be shown on this report whether working any part of a day, week or month. (Do not include owners, co-owners, officers of a corporation or clerical workers.) When there are no employees, a report must be filed bearing statement "NO EMPLOYEES." No premium payment is required when there are no employees, and should employment be terminated for an extended time or the business dissolved, a statement to that effect should be made with final payroll.

4. **Premium Rates**§—Effective March 1, 1945, all employers coming under the Industrial Accident Fund for the first time pay a premium rate of five per cent (5%) on their first twelve (12) monthly premium payments; and providing an employer's account shows a credit balance following the first twelve (12) premium payments, his premium rate is reduced to one and one-quarter (1 1/4%) and continues at one and one-quarter per cent (1 1/4%) rate until such time as an overdraft occurs on the employer's account, or he becomes exempt through classification as related in paragraph five (5) below.

(4 A) The monthly premium rate of employers having established accounts on which twelve (12) premium payments have been made, and providing such accounts have a credit balance, is one and one-quarter per cent (1 1/4%) rate.

Overdraft Accounts must pay premium rates as follows:

Overdraft	Rate Applied
(4-B) 1% or less of the annual payroll	3%
(4-C) Over 1% not more than 2%	4%
(4-D) Over 2% not more than 3%	4½%
(4-E) Over 3% not more than 4%	5%
(4-F) Over 4%	5½%

(4 G) **Annual Payroll:** Multiply current monthly payroll by twelve (12).

5. **Exempt Classification**—Employers having credit balance to their accounts equal to full one and fifty hundredths per cent (1.5%) of annual payroll, such credit being not less than two thousand dollars ($2,000.00), are not required to pay any premium; **however, employers in this classification are required to file the usual payroll reports monthly.**

8. **Board and Lodging**—If board and lodging or similar advantages are furnished to a workman by the employer in lieu of or in addition to cash wages, the value thereof must be carried on the payroll at the rate of twenty dollars ($20.00) per month.

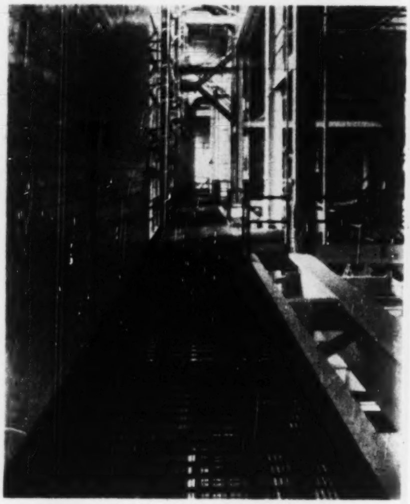
9. **Earnings Thru Commissions,** Piece Work, Overtime, Bonus or profit-Sharing Premiums, etc.—Workers paid commissions, by piece, foot, yard, ton or etc., are considered employees of the person or concern that employed them and supervises their work and should be shown on reports of such person or concern. Sub-contractors who contract to perform a specific service and hire their own workers must have accounts separate from account of general or prime contractor or other concern as they would be classified as employers rather than hired workers or employees.

§Non-resident employers now must give Performance bond or other security of $500, and $3,000 Indemnity in either cash, U. S. Treasury bonds or surety form. Willful failure or negligence to give security subject to $500–$5000 fine.

Specify

BORDEN

Floor Gratings and Safety Steps



With all these features

- Genuine Tailor made Floor Grating.
- As easy to Walk over as a solid floor —No uneven surfaces.
- Designed and recommended for minimum deflections.
- You hardly know you are walking on a floor 70% to 90% open—Only possible on Genuine Grating.
- Note symmetrical, graceful lines of whole pattern.
- Ventilating, Fire-proof—durable.

Made in any style and size for any floor opening and for any load.

Representatives in all principal Cities

SEE OUR CATALOG IN SWEET'S

For Safety—Quality and Appearance—Specify "BORDEN"
See the Difference!
A Genuine all Purpose Floor Grating

Write for your A.I.A. file on
"BORDEN GRATINGS" and SAFETY STEPS

BORDEN METAL PRODUCTS COMPANY
ELIZABETH, N. J.

Base rates on compensation insurance for construction—January 1, 1950

Compiled by Herbert L. Jamison & Co., Insurance Advisers and Auditors, New York, N. Y. (Base rates—subject to increase or decrease according to experience ratings)

CLASSIFICATION OF WORK	Ala.	Alas.	Ariz.	Ark.	Calif.	Colo.	Conn.	Del.	D. C.	Fla.	Ga.	Ida. K	Ill. K	Ind.	Iowa	Kans.	Ky.	La.	Me. P	Md.	Mass. O	Mich.	Minn.	Miss.	Mo.
1. Carpentry: 1-2 family residences A	1.13	3.47	6.01	3.49	3.93	1.67	3.37	1.55	2.42	1.18	1.41	3.05	2.09	1.87	2.34	1.58	2.22	4.42	1.56	1.50	2.75	M	2.73	4.43	2.47
3 stories or less A	1.21	3.95	6.01	3.58	3.93	1.67	3.37	1.55	2.49	1.18	1.41	3.05	3.07	2.33	2.36	2.31	2.22	4.61	1.79	2.14	2.75	M	2.73	4.43	2.47
Inter. trim, cabinet work B	.67	2.34	6.01	1.88	3.93	.89	2.00	1.55	1.93	1.18	.94	1.51	1.41	.98	1.00	1.08	1.26	2.18	.94	1.60	1.65	1.72	2.73	2.09	2.47
General	1.40	7.94	6.01	4.71	3.93	2.52	4.97	1.55	3.54	2.33	2.39	4.75	4.09	2.56	2.36	3.23	3.40	5.98	2.99	3.08	6.19	2.41	2.73	5.57	2.47
2. Chimney const: st, br, concr, incl fdns	5.03	12.22	14.59L	13.17	13.25	6.75	13.12	J	13.22	8.58	6.13	12.67	8.82	7.53	6.68	8.80	11.04	16.09	6.23	8.93	6.08	10.19	9.12	14.66	12.85
3. Conc work: Bridges or culverts C	2.89	7.14	4.45	8.16	5.46	3.69	9.34	1.30	8.70	4.38	3.90	6.70	4.54	3.90	5.33	4.26	4.94	6.57	5.12	5.36	8.00	4.59	5.57	9.11	6.39
1-2 fam residences, 3 sts or less	.76	6.75	4.45	2.22	1.45	1.90	3.30	1.30	3.16	1.88	.78	2.43	2.16	1.23	1.27	1.93	1.32	2.74	1.80	1.66	4.56	1.46	1.56	2.73	1.80
General	1.84	7.14	4.45	3.59	3.11	3.10	4.50	1.30	3.51	2.60	1.97	4.94	3.10	1.78	2.25	3.46L	3.10	5.70	2.11	2.53	4.01	2.55	1.90	4.34	3.48L
4. Conc or cmt flrs, wlks, drways, yrds	.83	2.76	4.45	2.02	3.11	1.09	2.15	1.30	1.61	1.55	1.25	1.87	1.36	1.14	1.07	1.48	1.54	2.65	1.17	2.05	1.73	1.18	1.34	2.28	2.00
5. Electric wiring	1.10	1.83	2.46	1.72	2.19	1.09	1.67	1.30	1.54	1.32	1.31	1.69	1.40	1.00	1.21	1.16	1.29	1.65	.99	1.37	1.32	1.35	.97	1.94	1.22
6. Excavation: Earth D	1.42	3.82	4.69	3.73	2.11	2.75	3.40	.95	2.97	1.95	1.56	5.17	2.17	1.29	1.80	2.45	2.85	2.23	2.23	2.32	3.68	2.17	2.38	4.00	2.71
Rock E	2.35	9.09	7.33	6.42	5.01	3.13	6.88	.95	6.31	4.35	3.36	6.09	4.65	3.46	3.32	3.91	4.64	7.47	2.97	4.13	7.90	4.34	4.62	6.61	5.95
7. Glaziers	1.91	4.33	5.47	4.75	5.18	2.50	5.29	.65	4.49	3.43	2.80	4.45	3.46	2.77	2.68	3.11	3.70	5.94	2.50	3.31	3.80	3.87	3.57	5.30	3.44
8. Insulation	.86	3.50	J	2.51	2.76	1.39	2.15	J	2.40	1.60	.96	2.52	1.96	1.98	1.79	1.79	1.92	2.84	1.56	1.58	2.84	1.35	1.87	3.06	1.55
9. Lathing: not reinfd concr metal lathing	.90	3.50	3.26	2.47	2.76	1.17	2.58	.65	2.09	1.41	1.25	2.05	1.45	1.30	1.30	1.44	1.70	2.84	1.23	1.60	2.39	1.47	1.53	2.76	2.32
10. Masonry	.76	5.95	3.87	2.22	2.24	1.90	3.30	1.90	2.37	1.88	.78	2.43	2.12	1.23	1.27	1.93	1.32	2.74	1.80	1.66	4.56	1.46	1.51	2.73	1.74
11. Painting, Decorating, Paperhanging	1.23	4.77	3.73	2.94	3.89	2.00	4.17	.30	3.46	1.93	1.65	3.47	2.31	2.24	1.90	2.38	2.05	3.88	1.56	2.32	J	1.96	1.64	3.56	2.21
12. Piledr—fdns, timb wharf F	4.52	9.10	15.40	12.74	9.04	6.56	6.07	J	9.91	5.51	5.08	11.39	6.75	6.45	5.17	8.13	9.21	15.53	3.09	5.62	4.89L	8.53	6.80	14.24	11.99
13. Plastering: Interior	.86	3.59	4.41	2.51	2.76	1.39	2.15	.65	2.40	1.60	.96	2.52	1.96	1.98	1.79	1.79	1.92	2.79	1.56	1.58	2.84	1.35	1.87	3.06	1.55
14. Plumbing	.71	1.82	2.97	1.69	1.45	1.17	1.98	.80	1.74	1.25	.94	1.80	1.55	1.06	1.16	1.21	1.22	2.09	1.30	1.47	1.61	1.49	1.39	1.94	1.31
15. Roofing	3.14	8.95	6.90	6.83	7.54	4.41	7.70	1.70	7.25	3.94	3.02	8.53	6.37	4.26	5.97	6.00	5.31	7.96	6.15	6.10	8.90	6.08	5.39	8.52	7.56
16. Sheet metal work erection	1.25	3.04	3.67	3.06	3.04	1.57	2.75	1.70	2.54	2.11	1.38	2.56	2.65	1.64	1.79	1.68	2.50	3.91	1.43	1.91	1.86	1.46	1.51	3.39	2.02
17. Steel erection: Door frame or sash	1.21	5.21	3.36	3.06	3.49	1.65	3.58	4.25	2.87	2.33	1.67	J	2.93	1.80	1.76	1.99	2.39	3.99	1.69	2.19	2.94	2.67	2.39	3.44	2.80
Interior ornamental	1.30	4.59	3.85	3.49	3.49	1.74	3.71	4.25	3.95	2.26	1.74	J	2.47	1.89	1.83	2.11	2.45	4.21	1.77	2.30	2.94	2.20	2.51	3.93	3.30
Structural	5.59	19.66	20.11	14.00	13.32	10.99	13.23	4.25	21.24	9.24	7.98	17.14	8.55	6.79	10.65	9.45	14.74	11.12	7.89	7.71	16.37	12.12	7.87	16.64	13.22
Dwellgs, 2-st or less	2.95	10.77	7.96	8.14	M	4.30	8.69	4.25	7.37	5.58	4.09	7.82	6.22	3.46	4.30	5.46	6.37	8.55	4.42	5.54	M	5.36	5.25	9.26	7.72
General	4.60	11.95	20.11	13.67	6.88	6.75	9.66	4.25	16.92	6.36	6.32	12.15	6.82	3.38	8.53	7.33	7.34	11.12	6.26	6.64	13.70	5.93	7.08	15.22	6.08
18. Tile, st, mosaic or terz—int only	.58	1.11	2.07	1.61	1.47	.77	1.73	.40	2.14	.89	.85	1.30	1.02	.83	.86	.93	1.07	1.86	.84	1.21	1.41	1.30	1.13	1.78	1.10
19. Timekeepers, Watchmen G	1.32	5.95	M	2.92	M	1.74	3.84	M	2.96	2.33	1.84	2.95	2.65	1.89	1.90	2.11	2.40	4.23	1.80	2.32	3.10	2.36	2.53	3.26	3.32
20. Waterproofing: Brush applic	1.23	4.77	3.73	2.94	3.89	2.00	4.17	J	3.46	1.93	1.65	3.47	2.31	2.24	1.90	2.38	2.05	3.88	1.56	2.32	M	1.96	1.64	3.56	2.21
Trowel applic—int	.86	3.50	4.41	2.51	2.76	1.39	2.15	J	2.40	1.60	.96	2.52	1.96	1.98	1.79	1.79	1.92	2.79	1.56	1.58	2.84	1.35	1.87	3.06	1.55
Trowel applic—ext	.76	5.95	3.87	2.22	2.24	1.90	3.30	J	2.37	1.88	.78	2.43	2.12	1.23	1.27	1.93	1.32	2.74	1.80	1.66	4.56	1.46	1.51	2.73	1.74
Press gun applic	1.84	7.14	4.45	3.59	3.11	3.10	4.50	J	3.51	2.60	1.97	4.94	3.10	1.78	2.25	3.46L	3.10	5.70	2.11	2.53	4.01	2.55	1.90	4.34	3.48L
21. Wrecking H	7.27	15.99	25.59	18.99	17.88	10.10	19.50	10.00	16.86	11.93	9.40	J	10.58	7.18	10.73	8.60	13.68	23.85L	10.05	10.69	16.32L	19.21	10.42	21.28	12.80

CLASSIFICATION OF WORK	Mont. K	Neb.	Nev. P	N. H.	N. J.	N. Mex.	N. Y.	N. Car.	N. Dak.	Ohio N	Okla.	Ore.	Pa.	R. I. K	S. Car.	S. Dak.	Tenn.	Tex. P	Utah	Vt.	Va.	Wash.	W. Va.	Wisc	Wyo.
1. Carpentry: 1-2 family residences A	3.32	2.89	N State Insurance Plan: Nevada Industrial Commission Carson City, Nevada—see accompanying page	2.23	2.30	2.38	5.47	1.31	N State Insurance Plan: Workmen's Compensation Bureau Bismarck, North Dakota—see accompanying page	.98	3.14	6.36	1.55	4.40	2.50	1.54	1.60	2.49	1.70	1.70	1.46	4.59	N State Insurance Plan: State Compensation Commission Charleston, W. Va.—see accompanying page	3.31	N State Insurance Plan: Manager, Workmen's Compensation Dept. State Treasurer's Office, Cheyenne, Wyo—see accompanying page
3 stories or less A	3.32	2.89		2.23	3.00R	2.21	5.47	1.79		.98	4.06	6.36	1.55	5.00	2.61	1.54	2.02	M	1.70	1.70	1.69	4.59		3.31	
Inter. trim, cabinet work B	1.61	1.25		1.19	1.75	1.06	5.47	1.17		.83	2.39	2.94	1.55	3.85	1.70	1.15	1.28	2.01	M	.81	.83	1.50		3.31	
General	5.33	3.22		3.84	3.20	3.25	5.47	2.31		1.35	5.04	7.49	1.55	9.50	5.38	1.49	2.42	3.30	1.70	2.34	2.17	6.08		3.31	
2. Chimney const: st, br, concr, incl fdns	15.00	9.38		8.56	8.30	7.87	21.35	8.24		5.78E	17.91	J	J	33.02	14.60	6.31	9.05	13.42	9.57	5.64	5.31	J		12.68	
3. Conc work: Bridges or culverts C	7.45	5.44		5.81	4.10L	5.14	8.74	4.23		1.35	10.82	9.84	2.00	17.24	10.09	4.34	M	3.30	5.13	3.55	3.27	7.57		5.85L	
1-2 fam residences, 3 sts or less	2.62	1.84		2.50	3.40L	1.62	M	1.14		.98	3.86	5.83	2.00	5.02	1.75	1.40	1.31	3.30	2.30	1.90	1.05	4.48		1.93L	
General	4.84	2.81		4.26	3.80L	2.49	5.93L	1.96		1.35	6.77	6.69	2.00	7.52	5.27	2.49	2.09L	3.30	3.11L	1.99	1.67	5.15		2.59	
4. Conc or cmt flrs, wlks, drways, yrds	1.99	1.51		1.47	1.50L	1.33	3.47L	1.03		.75	2.72	3.19	2.00	5.06	2.18	1.38	1.39L	3.30	1.42	1.01	.76	2.30		1.98L	
5. Electric wiring	1.79	1.43		1.26	1.26	1.11	3.11	1.20		.57	2.09	3.29	1.00	2.61	2.29	1.20	1.30	2.07	1.45	.89	.97	2.53		1.28L	
6. Excavation: Earth D	5.45	2.18		2.94	3.20L	4.14	5.76	1.26		.84	3.60	7.46	1.60	8.51	2.65	2.02	2.62	M	2.86	2.25	1.44	5.39		3.59	
Rock E	6.23	4.75		4.25	6.60	3.67	10.92L	5.58		J	8.29	J	1.60	14.56	7.26	3.93	5.19	6.62	4.03	2.78	2.98	10.49		6.42L	
7. Glaziers	4.94	3.50		3.26	3.80	2.93	8.17	2.95		1.24	6.63	6.73	1.00	11.41	5.46	2.77	3.50	4.72	1.15	2.22	2.17	5.17		4.95	
8. Insulation	2.72	2.07		1.93	2.00	1.69	4.75	1.34		M	3.69	5.72	J	5.88	2.76	1.76	1.53	2.62	3.09	1.30	1.24	4.04		2.64	
9. Lathing: not reinfd concr metal lathing	2.26	1.69		1.58	2.00	1.42	3.06	1.43		.49	3.18	5.72	.90	5.30	2.55	1.44	1.72	2.69	1.75	1.07	1.07	4.04		2.71	
10. Masonry	2.62	1.84		2.50	3.00	1.62	5.33	1.14		1.05E	3.17	5.83	1.30	5.02	1.75	1.40	1.31	3.30	1.92	1.90	1.05	4.48		1.93	
11. Painting, Decorating, Paperhanging	3.89	2.79		3.05	3.90L	2.23	6.31	1.27		1.24	3.58	6.67	2.10	5.33	4.49	2.36	1.88	2.33	1.94	1.71	1.21	5.13		2.37	
12. Piledr—fdns, timb wharf F	12.82	9.19		4.28	4.10	7.69	8.73	7.96		6.17	17.61	15.90	MJ	11.94	9.91	7.48	9.15	11.90	5.62	2.90	5.08	11.67		11.34	
13. Plastering: Interior	2.72	2.07		1.93	2.00	1.69	4.75	1.34		.49	3.52	5.72	.90	5.88	2.76	1.76	1.53	2.42	3.09	1.30	1.24	4.04		2.10	
14. Plumbing	1.92	1.58		1.37	1.55	1.33	3.51	1.17		.70	1.96	2.91	.95	2.92	1.72	1.42	1.21	1.86	.95	1.07	.82	2.24		2.42L	
15. Roofing	9.51	7.84		7.10	6.40	7.00	J	5.11		2.54	15.58	15.59	2.30	14.28	6.76	5.31	4.12	6.42	5.37	4.25	4.59	J		8.17	
16. Sheet metal work erection	2.74	2.45		1.89	1.90	1.73	3.97L	1.66		2.84	3.24	6.42	2.30	7.43	2.70	1.74	2.14	2.26	1.94	1.33	1.40	4.59		2.44	
17. Steel erection: Door frame or sash	3.09	2.32		2.15	2.70L	1.93	4.97	1.93		1.47	4.41	3.55	5.25	7.28	3.17	1.95	2.33	3.50	1.73	1.45	1.44	J		3.58	
Interior ornamental	3.25	2.41		2.25	JL	2.04	4.02	2.01		1.47	4.66	5.94	5.25	7.69	3.58	2.04	2.46	3.72	1.73	1.54	1.51	4.57		3.48	
Structural	19.89	12.39		12.08	14.10L	11.70	20.28	9.22		3.97	17.12	25.39	5.25	39.84	19.15	9.67	8.30	10.36	M	8.12	6.02	19.52		8.83	
Dwellgs, 2-st or less	8.91	5.84		5.80	5.00L	5.05	11.12	4.77		M	9.63	12.19	5.25	18.91	9.43	3.94	5.36	M	5.72	3.78	3.59	9.53		5.33	
General	13.67	9.42		8.65	7.30L	7.34	15.45	9.22		3.97	13.71	J	5.25	30.03	13.91	6.83	6.97	8.04	7.74L	5.82	5.08	12.98		10.36	
18. Tile, st, mosaic or terz—int only	1.37	1.10		1.04	1.40	.94	3.10	.89		.51E	2.08	2.10	.60	3.27	1.57	1.01	1.14	1.43	1.95	.74	.70	1.62		1.08	
19. Timekeepers, Watchmen G	3.17	2.45		2.25	J	2.02	6.70	2.01		M	4.64	5.45	M	7.57	3.10	2.15	2.46	M	2.29	1.56	1.59	4.69		3.78	
20. Waterproofing: Brush applic	3.89	2.79		3.05	3.90L	2.23	6.31	1.27		Q	3.58	6.67	MJ	5.33	4.49	2.36	1.88	2.33	1.94	1.71	1.21	5.13		2.37	
Trowel applic—int	2.72	2.07		1.93	2.00	1.69	4.75	1.34		Q	3.52	5.72	MJ	5.88	2.76	1.76	1.53	2.42	3.09	1.30	1.24	4.04		2.10	
Trowel applic—ext	2.62	1.84		2.50	3.00	1.62	5.33	1.14		Q	3.17	5.83	MJ	5.02	1.75	1.40	1.31	3.30	1.92	1.90	1.05	4.48		1.93	
Press gun applic	4.84	2.81		4.26	3.80L	2.49	5.93L	1.96		Q	6.77	6.69	MJ	7.52	5.27	2.49	2.09L	3.30	3.11L	1.99	1.67	5.15		2.59	
21. Wrecking H	19.75	14.10		12.97	15.10L	11.81	J	9.57		3.65	23.39	32.43	10.00	38.98	11.06	11.33	11.67L	19.79	21.59	8.91	7.80	24.93		16.47	

•A Incl install int trim, bldr's finish, cabinet work & constr of pvt garages. •B Not avail to contr engaged in any other carpentry install oper. •C Incl form work, scaffolds, falsewk or concr distr equip. (Excav, piledr, work in tunnels, subways, caissons or cofferdams separately rated). •D Piledr, shaft sinkg, caisson or cofferdam work seperated. •E Spec occupational disease rate applicable. •F Mfg of concr piles at job sites or pouring concr into hollow steel piles rated as "Concr, Not Otherwise Class" (General). •G Not avail if gen contr conducting oper at job. •H Spec. class avail for Fed War Housing or Military Reserve dismantling. •J Rate avail on application to company. •K Advisory rates only. •L Spec. class wording. •M Class not avail. •N Compensation must be insured in monopolistic state fund. •O Rates increased effective Feb. 6 due to laws liberalizing benefits paid. Roofing and concr constr rates up most. •P Rate revision pending. •Q Class do not apply. Waterproofing rates incl. basemts & fndns—.75; roofs or side walls—2.54. •R Avail only on jobs completely located and identified in policy schedule or endorsement.

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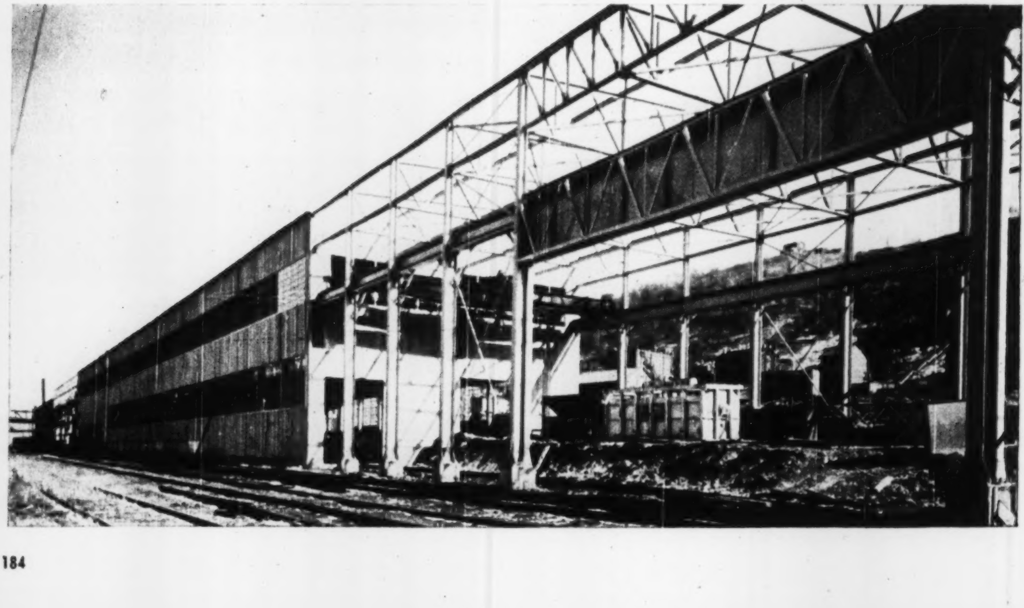


Construction financing costs low and stable

Interest rates on bonds sold to finance construction are the lowest they have been since 1947 and promise to stabilize close to present lows.

Municipal bond interest rates, measured by yields, averaged 2.08% for January, 1950, compared with 2.15% a year before and 2.28%, in June, 1949. These rates compare with 4.71% at their depression high in 1933.

A 1 plus industrials yielded 2.42% in January, 1950, compared with 2.58% a year before, 2.59% in March, 1949, and 5.40% at their depression high in 1932.

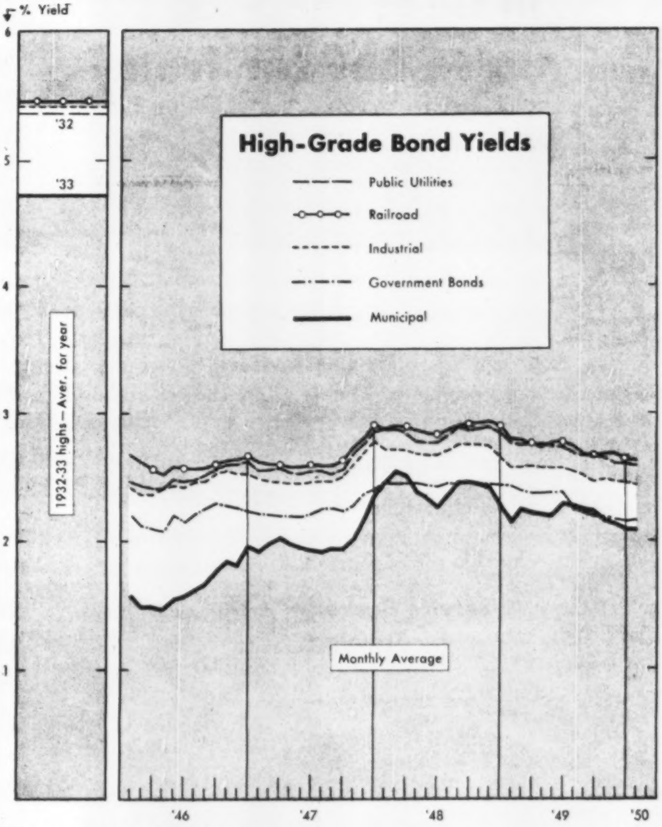
Construction borrowing costs reached their lowest in 1946 then climbed to a postwar high in 1948. Municipals in January, 1950, were down 1.8% and industrials 1.2% from their 1948 tops.

Current rates are not expected to change much in the foreseeable future. The reason is that the federal government wants to keep them low and fairly stable. Range of fluctuation of interest rates is controlled by the U. S. Treasury through its control of supply of and demand for U. S. Government bonds. Rates on other types of bonds and loans tend to maintain a fairly fixed relationship to government bond rates, municipals varying most.

Bond yields—per cent

	Govt.† (1)	U. S. Treas. (2)	Municipal (3)	Industrial (4)	Pub. Util. (5)	Railroad (6)
1933		3.31	4.71	4.98	4.69	4.55
1934		3.12	4.03	4.28	4.19	4.01
1935		2.79	3.41	3.73	3.59	3.58
1936		2.69	3.07	3.34	3.38	3.31
1937		2.74	3.10	3.16	3.22	3.45
1938		2.61	2.91	2.82	2.99	3.60
1939		2.41	2.76	2.64	2.83	3.39
1940		2.26	2.50	2.57	2.75	3.26
1941		2.05	2.10	2.50	2.69	3.16
1942	2.27	2.09	2.36	2.54	2.71	3.17
1943	2.29	1.98	2.06	2.55	2.63	3.10
1944	2.38	1.92	1.86	2.58	2.64	3.01
1945	2.34	1.66	1.67	2.50	2.59	2.75
1946	2.19	Disc	1.64	2.44	2.50	2.59
1947	2.24		2.01	2.52	2.59	2.62
1948	2.43		2.40	2.70	2.83	2.89
1949	2.28		2.21	2.53	2.69	2.71
1949						
J	2.40		2.15	2.58	2.77	2.78
F	2.38		2.23	2.58	2.75	2.77
M	2.37		2.21	2.59	2.75	2.75
A	2.37		2.20	2.57	2.75	2.74
M	2.37		2.20	2.57	2.74	2.75
J	2.37		2.28	2.57	2.73	2.76
J	2.24		2.26	2.53	2.69	2.73
A	2.21		2.20	2.50	2.66	2.66
S	2.19		2.22	2.45	2.64	2.66
O	2.18		2.21	2.47	2.64	2.66
N	2.16		2.17	2.46	2.60	2.66
D	2.15		2.13	2.44	2.60	2.63
1950						
J	2.11		2.08	2.42	2.59	2.62

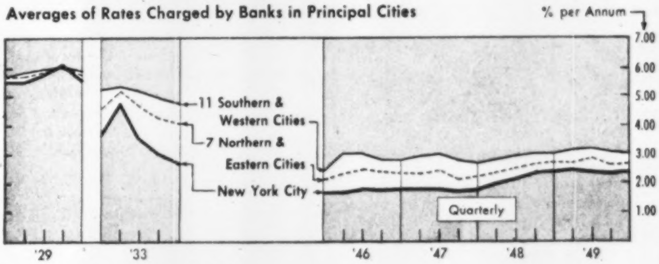
(1) †Standard Statistics & Poors—aver. long-term government bonds, taxable. To replace the long-term U. S. Treasury bonds series discontinued after December, 1945.
(2) Aver. yield of long-term U. S. Treasury bonds, partially tax exempt, not due or callable for fifteen years. Federal Reserve Bulletin.
Standard Statistics & Poors—
(3) aver. 15 high-grade long-term municipals.
(4) aver. A1 plus industrials.
(5) aver. A1 plus public utilities.
(6) aver. A1 plus railroads.



Data: Standard Statistics & Poors, Chart: ENR Business News

Commercial Loan Rates

Averages of Rates Charged by Banks in Principal Cities



Data: Federal Reserve Board, Chart: ENR Business News

Prices & yields, state & municipal bonds

Trends in prices, yields and maturities of municipal bonds for selected cities from each of the 48 states are reported annually by Chemical Bank & Trust Co., New York. The averages for these issues are shown in the accompanying table. The report shows individual issues also, for example, Alabama State Highway 4¼s due 1962 sold for 128⅝ in December, 1949, to yield 1.70%. Birmingham 4½s, due 1957, sold for 118½ to yield 1.85%.

Year	Average Price	Average Yield	Average Maturity	Number of Issues
1933	90 7/8	5.29%	16 3/4	100
34	106 1/2	3.82	16 3/4	101
35	113 3/8	3.24	16 1/4	96
36	119 7/8	2.73	15 3/4	91
37	115 1/8	3.07	15 1/2	90
38	119 1/2	2.68	14 3/4	88
39	122 1/8	2.34	15 1/2	117
40	130 1/8	1.85	16 3/4	83
41	126	2.12	16 1/2	86
42	127 5/8	2.10	17 1/4	109
43	131 7/8	1.71	16 3/4	112
44	133 1/8	1.61	16 3/4	108
45	134 3/4	1.47	16 1/2	104
46	129	1.79	16	98
47	119 7/8	2.18	15 1/4	109
48	120 7/8	2.00	14 1/4	106
49	122 1/4	1.85	14 1/2	97

Comparison by Chemical Bank & Trust Co., New York

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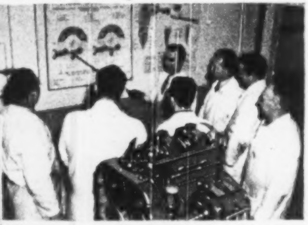
OWNERS of General Motors Diesel engines and GM Diesel-powered equipment know they can depend upon receiving courteous service *after* as well as *before* the sale. They know that, wherever they are, a GM Series 71 Diesel Distributor or Dealer is ready to answer call for a quick tune-up, a repair or a Factory-Engineered GM Diesel part. Staffs of factory-trained service men have the tools, the know-how and a thorough, capable interest in seeing that every engine delivers its best. Here, for your convenience, is a list of GM Diesel Industrial Distributors and Dealers in strategic locations throughout the United States.

Service Backed by Training



AT THE FACTORY—GM Distributor and Dealer service men, as well as customer personnel, take courses in the maintenance and repair of GM Series 71 Diesel engines at the Detroit Diesel Engine Division Factory Service School. Classes of 12 students are scheduled every two weeks. Enrollment is limited so that each participant may be assured of personalized instruction, with emphasis on actual shop procedures.

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IN THE FIELD—Completely equipped Mobile Training Units, currently touring the country, bring specialized instruction in the proper operation and maintenance of GM Diesel engines to contractors' personnel. Itinerary of the units includes scheduled visits to major construction and mining projects as well as stops at GM Distributor points where groups of smaller contractors' personnel meet for 2 or 3 day courses.

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Montgomery
ALABAMA MACHINERY & SUPPLY CO.

ALASKA—(Seattle, Wash.)
Anchorage, Fairbanks
YUKON EQUIPMENT, INC.

ARIZONA—Phoenix
STATE TRACTOR & EQUIPMENT CO.

ARKANSAS—Stuttgart
EDDINS SERVICE
Little Rock
LEWIS DIESEL ENGINE CO.
Memphis, LOVE SUPPLY CO.
Fort Smith
R. A. YOUNG & SON, INC.

CALIFORNIA—Los Angeles
ANDERSON-O'BRIEN CO.
Lancaster, LANCASTER ENGINE CO.
Stockton, Fresno
MOORE EQUIPMENT CO., INC.
Berkeley, Pt. Richmond, Eureka
N. Sacramento
WEST STATE ENGINE &
EQUIPMENT CO.
Bakersfield
FARM IMPLEMENT & ENGINE CO.
Corcoran, FARMERS MACHINERY CO.
Visalia
TULARE COUNTY TRACTOR CO.

COLORADO—Denver
THE COLORADO BUILDERS'
SUPPLY CO. (Equipment Div.)

CONNECTICUT—Hartford
HOLMES-TALCOTT CO.

FLORIDA—Jacksonville, Miami
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FLORIDA DIESEL ENGINE SALES
Tampa, GENERAL ENGINE &
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Tallahassee, ARTHUR F. SWAIN CO.
Ocala
BAILEY MOTOR & EQUIPMENT CO.
Orlando, SQUARE DEAL MACHINERY
& SUPPLY CO.
Fort Pierce
EQUIPMENT SALES & SERVICE CO.
Sebring, H. N. WEBSTER HEATING &
COOLING, INC.
Pensacola
DIESEL SALES & SERVICE, INC.
W. Palm Beach
MARINE ENGINE & EQUIPMENT CO.

GEORGIA—Atlanta, Albany
BLALOCK MACHINERY &
EQUIPMENT CO.
Waycross
TRACTORS & EQUIPMENT, INC.
Savannah, MORGAN'S, INC.
Rome
ROME FARM EQUIPMENT CO.

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GENERAL MOTORS
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POWER

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ILLINOIS—[illegible], Rockford
KENNEDY-COCHRAN CO.
Centralia
WESTERN MACHINERY & ENGINE CO.

INDIANA—[illegible]
FLEISCHMILLER TRACTOR CO.

IOWA—Des Moines, Sioux City
[illegible], INC.

KANSAS—[illegible]
[illegible]
Topeka
C. A. SMITH & SON IMPLEMENTS, INC.
Salina, SALINA TRACTOR CO., INC.
Dodge City
POWER [illegible]
Wichita, Great Bend
DIESEL EQUIPMENT [illegible]

KENTUCKY—[illegible]
[illegible]

LOUISIANA—[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

MAINE—[illegible]
EASTERN TRACTOR & EQUIPMENT CO.

MARYLAND—[illegible]
[illegible]

MASSACHUSETTS—[illegible]
[illegible]

MICHIGAN—Detroit, Grand Rapids
THE EARLE EQUIPMENT COMPANY

MINNESOTA—St. Paul, Duluth
BORCHERT-INGERSOLL, INC.

MISSISSIPPI—Jackson, Louisville
TAYLOR MACHINE WORKS

MISSOURI—North Kansas City,
[illegible] POWER CO.
St. Louis, EUCLID SALES & SERVICE INC.
[illegible]
[illegible] SALES & SERVICE, INC.
[illegible] MACHINERY & ENGINE CO.

MONTANA—[illegible]
[illegible] MACHINERY CO., INC.
[illegible]
MOUNTAIN TRACTOR CO.

NEBRASKA—Omaha
[illegible] TRACTOR & EQUIPMENT CO.
[illegible] THE COLORADO BUILDERS SUPPLY CO.
(Equipment Div.)

NEVADA—[illegible]
[illegible]
[illegible]

NEW JERSEY—[illegible]
[illegible]
[illegible]

NEW MEXICO—[illegible]
[illegible]
[illegible]
[illegible], INC.

NEW YORK—[illegible]
[illegible]
[illegible]
[illegible] TRACTOR CO., INC.

NORTH CAROLINA—[illegible]
[illegible]
[illegible]
[illegible] SERVICE, INC.
[illegible]
[illegible] & SON, INC.
[illegible]
[illegible] & CO.
[illegible]
FARMERS SUPPLY CO.
Hendersonville
FRANCIS & WRIGHT, INC.

NORTH CAROLINA (continued)
Goldsboro, JOHNSON-SHERMAN CO.
Lenoir
LENOIR FARM EQUIPMENT CO.
Rockingham, MACHINE & SUPPLY CO.
[illegible], Fayetteville
[illegible], INC.
Washington
TALLEY IMPLEMENT CO., INC.

NORTH DAKOTA—Fargo
SWEENEY BROS. TRACTOR CO.

OHIO—Cleveland
GREAT LAKES DIESEL COMPANY
Steubenville
RAY C. CALL COMPANY

OKLAHOMA—Oklahoma City
DIESEL POWER CO.
Tulsa, DUNCAN EQUIPMENT CO.
[illegible]
[illegible] DIESEL SERVICE

OREGON—[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible] SALES & SERVICE, INC.

PENNSYLVANIA—[illegible]
[illegible]
[illegible] EQUIPMENT CO.
[illegible]
[illegible] EQUIPMENT CO.
[illegible]
[illegible] EQUIPMENT CO.

SOUTH CAROLINA—[illegible]
[illegible]
[illegible]
[illegible]
[illegible] FARM EQUIPMENT, INC.
[illegible]
[illegible] IMPLEMENT CO.
[illegible]
[illegible] EQUIPMENT CO.
North Augusta
[illegible] DIESEL CO.

SOUTH DAKOTA—Sioux Falls
SIOUX ROAD EQUIPMENT, INC.

TENNESSEE—Chattanooga
[illegible] MACHINERY & SUPPLY CO., INC.
Knoxville, STORY BROTHERS, INC.
Memphis
[illegible] DIESEL ENGINE CO.
[illegible] SALES, INC.
Nashville
[illegible] MACHINERY CO., INC.

TEXAS—[illegible]
[illegible]
STEWART & STEVENSON SERVICES, INC.
[illegible]
HARDY MACHINERY CO.
[illegible]
EQUIPMENT SUPPLY CO., INC.
[illegible] MACHINE CO.
[illegible]
EMPIRE MACHINERY CO., LTD.

UTAH—Salt Lake City
[illegible] EQUIPMENT CO., INC.

VERMONT—[illegible]
[illegible] CORPORATION

VIRGINIA—[illegible]
[illegible] CORP.
[illegible]
[illegible] & [illegible]
[illegible]
[illegible]
[illegible] & FARM SUPPLY
[illegible]

WASHINGTON—[illegible]
[illegible] & [illegible], INC.
[illegible]
[illegible] & EQUIPMENT, INC.
[illegible]
[illegible]
[illegible]
[illegible] EQUIPMENT CO., INC.

WEST VIRGINIA—[illegible]
RAY C. CALL COMPANY

WISCONSIN—Milwaukee
[illegible] TRACTOR CO., INC.

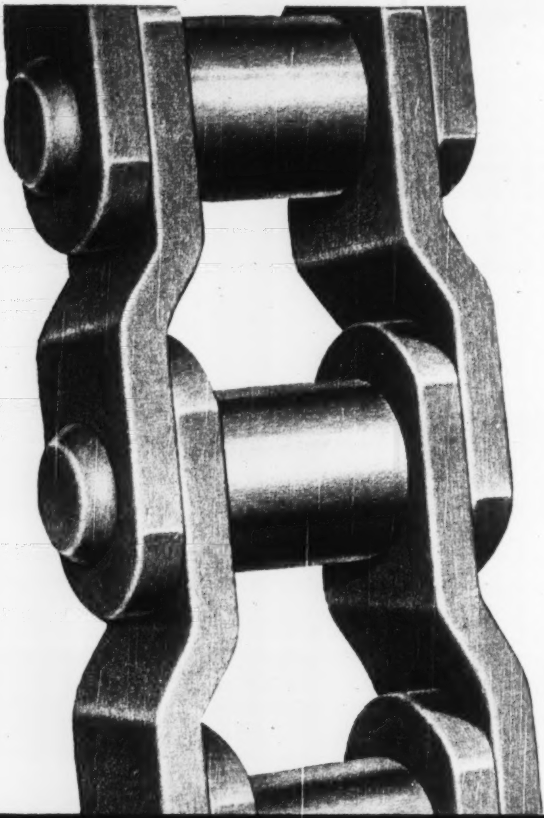
WYOMING—Casper
COLORADO BUILDERS SUPPLY CO.
(Equipment Div.)

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES...*Up to 275 H.P.* **DETROIT 28, MICHIGAN** MULTIPLE UNITS...*Up to 800 H.P.*

GENERAL MOTORS

Service also obtainable from:
General Motors Overseas Operations
General Motors Products of Canada
For Allis-Chalmers Tractors—all A-C dealers



A section of Steel Thimble Roller Chain. When you have need for such chains — call on Jeffrey, their originator.

CHAINS are important but often they are given little consideration until all else is accounted for. Whether for conveyors, elevators, other unit machinery or for driving purposes — correctly designed chains are highly essential. Chain is one of our earliest products — we know how to build it exceptionally well. A complete line — also attachments, sprockets and transmission machinery.

THE JEFFREY
MANUFACTURING COMPANY Established 1877
923 North Fourth St., Columbus 16, Ohio

Complete Line of
Material Handling,
Processing and
Mining Equipment

Baltimore 2
Birmingham 3
Boston 16
Buffalo 2
Chicago 1
Cincinnati 2
Cleveland 13
Denver 2
Detroit 13
Harlan
Houston 5
Huntington 19
Jacksonville 2
Milwaukee 2
New York 7
Philadelphia 3
Pittsburgh 22
St. Louis 3
Salt Lake City 1
Scranton 3

Depreciation Schedule— U. S. Bureau of Internal Revenue

In January 1942 the U. S. Bureau of Internal Revenue revised its 1931 schedule of probable useful life and depreciation rates. These rates are still in effect. Items of direct interest to civil engineers are shown in revised Schedule "F", and include those quoted in the following lists.

This schedule gives the "probable useful life" of buildings and equipment in years. Depreciation rates are calculated from the years of useful life on a straight-line basis. If, for example, the probable life is 10 years, the equipment may be depreciated at the rate of 10% a year. If 25 years, the rate is 4%.

BUILDINGS

	Bldg. Only Est. Life Years	Bldg. & Equip. Composite rate (per cent) Type of construction Good	 Average	 Cheap
Apartments	50	2½	2½	3
Banks	67	2	2	2½
Dwellings	60	2	2½	3
Factories	50	2½	2½	3
Farm bldgs	60	2	2	2½
Garages	60	2	2½	3
Grain elvtrs	75	1½	2	2½
Hotels	50	2½	2½	3
Loft bldgs	67	2	2	3
Mach. shops	60	2	2½	3
Office bldgs	67	2	2½	3
Stores	67	2	2	2½
Theaters	50	2½	3	3½
Warehouses	75	1½	2	2½

BUILDING EQUIPMENT

	Years
Air conditioning syst:	
Over 20 tons	20
5 to 15 tons	15
Under 5 tons	10
Air washer. (See dehumidifier.)	
Compressors:	
Refrigerating	20
Air for pneu. controls	20
Condensers:	
Shell and tube	20
Double pipe	20
Evaporation	15
Coolers, water—tank & coil or shell & tube	20
Dehumidifier	10
Drums, purge or surge	20
Ducts and other sheet metal work	*
Fans	15
Filters, air, oil, self-cleaning	20
Dry cleanable	10
Gauges	15
Grilles and registers:	
Anemostats	20
Grilles & registers:	
Wall type	20
Ceiling	20
Window units	15
Placques	20
Santrols	*
Heaters—boiler	
Oil burner & tank	20
Booster heaters	20
Electric heaters	15
Finned tube, steam water cleanable tube	20
Prehtrs. and rehtrs.	20
Water heaters, open or closed type	20
Insulation—Cork, cold pipes & tanks	20
Magnesia, hot pipes	15
Wool felt	20
Asbestos	15
Louvres & screens:	
Copper	25
Steel	15
Manometers	15
Motors:	
Synchr & exciter set	20
Induc., indoor	20
Induc., weatherproof for outdoor	20
Piping, refrig & other	20
Pumps	
Chilled water	20
Condenser water	20
Condensate	20
Dehumidifiers	22
Evap. condenser	15
Sump	25
Well	25
Receivers, refrigerant	25
Regulators, suction or static pressure	5
Silica gel beds	15
Spray pond	15
Switchbd, elec. panel	20
Thermometers, room type or recording	15
Tower, cooling	15
Valves: Relief	20
Automatic expansion and by-pass	5
Solenoid	15
Water regulating	20
Ammeters	15
Clocks	15
Clocks, watchman	15
Compressors, air & vacuum	20
Electric clock systems:	
Clocks, time	20
Conduits, fittings & wiring (See light. sys.)	
Motors & gener	20
Switch equipment:	
Boxes	*
Switch parts	20
Elevators:	
Freight	25
Passenger	20
Fire equipment:	
Fire alarm systems	25
Movable equipment	20
Sprinkler system	*
Guards, machine	25
Heaters, electric	10
Heaters, gas	15
Heating systems:	
Boilers & furnaces	20
Burner equipment	
Gas	16
Oil	10
Radiators	25
Lighting systems:	
Conduits and fittings	*
Wiring	20
Fixtures	15
Miscellaneous facilities:	
Awnings	5
Doors, louvre, vent	15
Incinerators	14
Safes and vaults	*
Screens, window	10
Shades	5
Venetian blinds	8
Plumbing:	
Faucets & flush valves	15
Bath tubs, lavatories, toilet bowls, etc	25
Pipes—	
Brass or copper	*
Iron, cold-water	25
Iron, hot-water or steam	20
Sewer, CI. or vitr	*
Valves—	
Brass body, water or steam	*
Iron body, water or steam	20
Pumps: Suct., pres.* & sump	13
Roofs:	
Asbestos	25
Asphalt and tar (prepared)	15
Galvanized iron	
Light or cold dipped	15
Heavy or hot dipped	20
Tar & grav. (5-ply)	20
Tarred felt	10
Copper, slate, tile, tin	*
Starters, electric	20
Switchboards, elect	25
Tanks and vats, water:	
Metal	25
Wood	15
Telephone equipment	
Conduits and fitting	*
Wiring & fixtures	20
Tools, small, misc	5
Transformers	25
Trucks, conveyance (within building)	10
Trucks, lift	15
Voltmeters	15
Welfare equip.:	
Athletic	10
Cafeteria	10
Hospital & first aid	10
Police and fire	10
Wells & well pumps	25

* Life of building

WATER SUPPLY

Impounding dams	150
Springs and wells	100
Infilt. galleries & tunnels	100
Collection conduits and reservoirs	75
Mains, cast iron:	
4-inch and less	50
6-inch	65
8 to 10-inch	75
12-inch and over	100
Settling basins	50
Coagulating basins	50
Filters	50
Steam engines	30
Diesel type engines	25
Pumps	30
Stand pipes	50
Meters	30
Hydrants	50
General office equip	19
General shop equip	20
General store equip	20
Laboratory equip	16

ARTIFICIAL GAS

Production Plant	Years
Struct. and impvts.	50
Boiler plant equip	30
Other power equip	40
Benches and retorts	35
Coke ovens	35
Producer gas equip	33
Water gas gener. equip	33
Petroleum gas equip	33
Other gas gener equip	33
Coal, coke, and ash handling equipment	40
Gas reforming equip	33
Purification equip	33
Residual refin. equip	40
Other prod. equip	33

Distribution Plant

Struct. and impvts.	45
Mains	80
Cast iron pipe	
4 in. and less	50
6 in.	65
8 to 10 in.	75
12 in. and over	100
Steel pipe—	
4 in. and less	30
5 to 7 in.	40
8 in. and over	50
Wrought iron pipe—	
¾ in. to 1½ in.	33
2 to 2½ in.	40
3 to 6 in.	50
8 to 10 in.	75
12 in. & over	100
Pump. & regulat. equip	35
Services	40
Meters	35
Meter installations	40
House regulators	40
House regul. instal.	40
Other property on customers' premises	33
Other distrib. sys. equip	35

BRIDGES

Conc. & steel or masonry, large	100
small	75
Steel, heavy	50
Steel, light	40

ELECTRIC UTILITIES

Steam Production

Struct. and impvts.	50
Boiler plant equip	28
Engines and engine driven generators	30
Turbo-generators units	30
Acces. elect. equip	28
Misc. pwr plant equip	28

Hydraulic Production

Struct. and impvts.	75
Reservoirs, dams and waterways	150
Waterwheels, turbines and generators	35
Acces. elect. equip	35
Misc. power plant equip	35
Roads, railroads and bridges	100

Transmission Plant

Struct. and impvts.	45
Station equipment	28
Towers and fixtures	50
Poles and fixtures	33
Overhead conductors and devices	50
Underground conduit	75
Underground conductors and devices	40
Roads and trails	60

Distribution Plant

Struct and impvts	45
Station equip	28
Storage battery equip	20
Poles, towers & fixt	35
Overhead conductors and devices	33
Underground conduit	60
Underground conductors and devices	40
Line transformers	28
Services	28
Meters	28
Instals. on customers' premises	25
Street lighting and signal systems	22

Depreciation tough problem with costs up

Depreciation is no longer a word limited to the vocabulary of accountants. Engineers and contractors are concerned with it because as taxes increase and construction costs rise, the rate of which facilities can be charged off to depreciation reserves influences whether building will be undertaken and when.

Because depreciation allowances are so important, Congress is hearing more and more about them, and pressure is building up for liberalization of the government's policy.

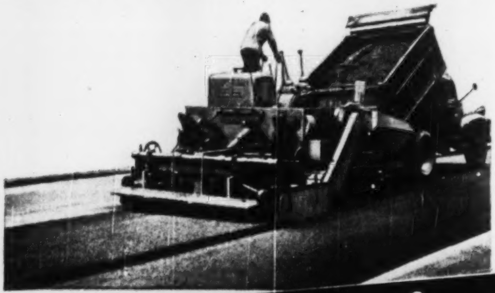
Industry is generally making up the difference between reserves and costs of new plants and equipment from profits. And it is, of course, paying taxes on those profits. This presents a serious problem because industry is faced with the problem of financing huge expansion and improvement programs. McGraw-Hill's survey of "Business' Needs for New Plant and Equipment," shows that American industry has plans now for investing some $55 billion in new plants and equipment in the next five years.

This puts a squeeze on many companies. They are short of cash because their depreciation reserves are providing only perhaps 50 percent of the cost of replacement.

Industry leaders such as Ben Moreell, chairman of the board and president, Jones & Laughlin Steel Corp., are seeking a change in tax polic yto relieve the squeeze. They are asking that companies be allowed to depreciate new equipment at an accelerated rate. Mr. Moreell, for example, proposes that companies be allowed to write off up to one-half of equipment costs within one to five years, and that they should be allowed to deduct this rapid amortization from taxable income. To safeguard the Treasury, he suggests that companies be allowed to limit amortization in any one year to no more than half their taxable income before the amortization is deducted.

The decision to build or not to build is influenced by the length of time it will take for the new facilities to pay off. The survey of "Business' Needs for New Plants and Equipment" by McGraw-Hill, showed that four out of five manufacturing companies (80 per cent) expect a new building to pay for itself in 15 years or less. More than 60 per cent of them insist that new construction pay off in 10 years or less. Now the "probable useful life" of such new construction might be much longer.

New Paver-Type Aggregate Spreader, first low cost, self-propelled spreader that operates entirely on the subgrade, accurately lays all base and surface aggregates, plant-mixed stabilized soil and free-flowing bituminous mixtures up to 12½′ (25′ in tandem).



Model BP-5 Bituminous Paver, the automatic leveling, precision paver you've been waiting for, that lays all bituminous materials up to 12½′ with almost instant width adjustability — no adding or removing parts.

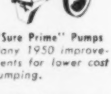
Jaeger offers

new ways to cut paving cost

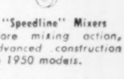
on 1950 jobs

Diagonal Screed Finishers and Concrete Screw Spreaders to "team" with your dual-drum paver. Also cost-saving Combination Spreader-Finisher for single screed work.

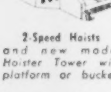
"Air Plus" Compressors in new standard sizes (75 to 600 ft.) that do 4 days' work in 3 with the same men and tools.



"Sure Prime" Pumps
Many 1950 improvements for lower cost pumping.



"Speedline" Mixers
More mixing action, advanced construction in 1950 models.



2-Speed Hoists
and new model Hoister Tower with platform or bucket.

Don't figure new jobs with old tools: See your Jaeger distributor or send for Catalogs on the new equipment you'll need to bid and build successfully in 1950.

THE JAEGER MACHINE CO., Columbus 16, Ohio
Leading distributors in 130 cities of the United States and Canada sell, rent and service Jaeger construction and paving machinery.

JAEGER
engineered equipment

Construction equipment depreciation schedule

The January, 1942, revision by the U. S. Bureau of Internal Revenue of its 1931 Schedule F of probable useful life and depreciation rates allowable for income tax purposes is still in use. Annual depreciation rates are computed on a straight-line basis. For example, on a probable useful life of ten years, annual depreciation is 10%; on 25-yr. life, annual depreciation is 4%. Probable useful life is shown below:

CONSTRUCTION EQUIPMENT

	Years
Automobiles: Light	2
Medium 3; Heavy	5
Backfillers, power:	
Light 3; Medium	5
Heavy 6; Tractor	5
Barges:	
Steel 30; Wood	25
Batcher plants:	
All steel, demount	10
Steel frame, wood bin	10
Stationary	14
Wood frame and bin	7
Batch, meas. devices	4
Benders, bar	5
Bending blocks	10
Bending mach.: Angle	15
Pipe & Rail	10
Bins: Steel, concrete	6
Steel 12; Wood	8
Bin frames, steel	6
Blacksmith shop, port.	4
Blocks, pulley, differential	6
Blowers, mechanical	10
Boilers: Upright	7
Locomotive	15
Stationary	20
Borers (wood), port	3
Boring apparatus, test.	10
Boxes, mortar & batch	3
Brakes: Bending	10
Cornice (sheet metal)	22
Breakers, pay., pneu	3
Buckets: Cableway	6
Clamshell 6; Concrete	5
Elevator	5
Orange peel	6
Bail, pivot turnover	5
Scraper or drag line	6
Buggies: Concrete	3
Timber	3
Building, job office or storage. (Life of job)	
Bulldozers:	
Gradebuilders	8
Tractor	4
Burner equip., gas & oil	12
Cables, wire	4
Cableways, cable only	3
Cableway carriage	5
Camping equip	3
Capstans, electric	10
Cars: Ballast spreader	10
Batch box, steel	5
Boarding and tool	20
Concrete	8
Derrick, bridge	10
Dump, steel 8; wood	6
Flat, steel 12; wood	10
Hand, Hopper, Scale	10
Skip hoist 10; Tank	20
Carts, concrete	3
Carts, tool (steel)	4
Cement gun machines	4
Chains	
Hawsers and lines	6
Power, transmissions	5
Channelers, rock	6
Chipping and calking tools, pneumatic	3
Chutes, con., gravity	2
Clamps, column form	5
Clean mach. for exterior of bldg., steam or sand	15
Compressors:	
Belt driven	10
Electric, portable	8
Gasoline, portable	6
Motor-truck unit	5
Steam portable	6
Conc. mach., pneumatic	5
Concrete mixers: Elec.	5
Gasoline, 3½s, 5s, 7s	3
Gasoline, 10s, 14s	4
Gasoline, 21s, 28s	5
Paving, gas, steam	8
Truck mounted	5
Controllers, motor	12
Conveyors:	
Belt, elevating—	
Portable	3
Stationary	6
Bucket	6
Cable—Drag	6
Monorail	15
Chain, portable	6
Portable 5; Scraper	6
Cranes:	
Bridge and cantilever	20
Crawler—Electric—	
2½, 5 tons	5
10, 15 tons	7
20 tons and over	9
Gas—2½, 5 tons	5
10, 15 tons	9
20 tons and over	12
Locomotive gas	7
Steam—2½, 5 tons	6
10, 15 tons	10
20 tons and over	12
Locomotive	10
Dragline	10
Universal (gas, 2½ to 5 ton), mounted on 10-ton truck	6
Dock or wharf, travel.	20
Craneways: Steel	15
Wood	10
Crushers, rock: Port	8
Stationary	10
Cutters: Bar, power	5
Corru. iron, hand	10
Cut & weld outfits, port	4
Derricks: Boat	10
Circle swing, hand	8
Crab—hand 16; power	10
Guy—Steel, 12; Wood	8
Stiffleg—steel 12; wood	8
Diggers, clay, pneu	3
Drag lines:	
Electric—½, ¾ cu. yd.	6
1, 1¼, and 1½ cu. yd.	8
2 cu. yd. & over	10
Gasoline—½, ¾ cu. yd.	5
1, 1¼ & 1½ cu. yd.	9
2 cu. yd. and over	12
Steam—½, ¾ cu. yd.	6
1, 1¼ and 1½ cu. yd.	10
2 cu. yds. & over	12
Dredges: Clamshell	16
Dipper 8; Hydraulic	20
Pipe	10
Drill boats	12
Drill points, well	5
Drills: Airdrifter	3
Elec. or pneu., hand, for wood or metal	5
Hand, electric	3
Rock, electric	3
Jackhammer	3
Steam	5
Traction, well	7
Tripod	7
Tunnel carriage	5
Well	10
Drums for oil (steel)	10
Elevators:	
Bucket, stationary	6
Cage (steel tower)	5
Engines:	
Blowing 12; Fire	7
Gas 10; marine 20; oil	20
Plumbing 14; Steam	11
Excavators:	
Cableway, complete	4
Trench, gasoline—	
7-ft. & 12-ft. depth	6
18-ft. depth	8
Trench, steam—	
7-ft. & 12-ft. depth	8
18-ft. depth	10
Trench, vert. boom	5
Wheel or ladder type	5
Extinguishers, fire	3
Fans, exhaust	15
Finishing machines	4
Floats, bridge (steel)	5
Forges, gas or oil	10
Forms:	
Conc. (metal pans)	5
Conc., supports, adj.	4
Steel, for—	
Pavements 4; Pipes	3
Roads 4; Walls	5
Tunnels & conduits	4
Furnaces, metal melting:	
Coal fired 10; Electric	12
Gas or oil	7
Generator sets:	
Steam engine	12
Turbine, headlight or floodlight	4
Gin poles (steel)	10
Graders: Blade, road—	
7, 8 foot blade	4
9, 10 foot blade	5
over 10-foot blade	8
Elevating	8
Form, subg. planers	6
Rooters, wheel	5
Grinders: Metal surface.	15
Saw filers & setters	14
Surface, concrete	4
Hammers: Electric	3
Pneumatic riveting	3
Heaters, asphalt, tar, and pitch kettles	4
Helmets, gas and diving suits and equip	10
Hoists: Chain	6
Air, electric, or steam	8
Elec. monorail or post	5
Gas 6; Hand power	8
Slew, elect. 8, steam	12
Holders on pneumatic	4
Hose: Fire, linen or rubber lined cotton	5
Metal, flexible	10
Oil 5; Reel or cart	10
Rubber, air, steam or water	10
Inundators, batch	4
Jacks: Hyd. 8; Rail	25
Rachet 8; Screw	5
Push and pull	3
Jibs, steam	17
Jointers, bench, electric, steam or gas	5
Ladders: Steel	3
Ladles, metal	7
Lathes: Metal working	15
Woodworking	17
Levee construction	
Drag lines	8
Shovels	8
Tower excavators	12
Life-saving equipment	10
Light plant	4
Lighters	22
Loaders, bucket:	
Crawler and Portable	5
Stationary	6
Locomotive battery	4
Locomotives, industrial:	
Diesel 10; Electric	16
Gas-Up to 10 tons	8
10 to 20 tons	15
Over 20 tons	20
Steam—	
Up to 10 tons	8
10 to 20 tons	18
Over 20 tons	20
Locomotives, std. gage.	30
Magnets, lifting	15
Mixers: port. mortar	3
Less than ½ cu. yd.	6
Over ½ cu. yd.	8
Caterpillar	8
Motors:	
AC and DC—Large	12
Medium 10; Small	8
Hydraulic 5; Pneu	5
Mowers, right of way	5
Pile drivers: Railroad	10
Barge 8; Track	12
Steam, on skids	10
Pile hammers steam or air; Heavy	10
Light 4; Medium	5
Pipe: Black or galv.	4
Wood	5
Wood & steel comb.	6
Pipe lines & fittings for floating dredges	10
Pit and quarry plants	6
Planers: Metalworking	15
Woodworking	20
Plows: Furrow 3; Rooter	6
Presses, drill	12
Pumping units:	
Electric—Centrifugal, Diaphragm, Piston, Gas—Centrifugal, Diaphragm	6
Hwy. contr's pump	4
Piston	5
Steam, centrifugal	10
Pumps: Air lift	10
Centrifugal, Humdinger, Impulse	6
Hydraulic 15; Oil	10
Steam piston unit	6
Testing for pipe lines	15
Punches, hydraulic	20
Punches for steel, pwr.	15
Racks, storage, for pipe and steel:	
Steel 20; Wood	15
Rails, steel	10
Razing equip., for bldgs	8
Reamers: Elec., Pneu.	3
Riveters, pneumatic	5
Rollers:	
Conc. finishing (steel)	10
Road, gas, steam	10
Rolls, ridge	5
Sand-blast outfits	10
Sawmills, portable	10
Saws: Band, cut-off and rip, power	10
Hand, Elec. & pneu.	3
Saws and woodworkers:	
Steel frames 10; Wood	5
Scales, large, track and wagon	20
Scarifiers: Attachments	4
Blocks, steerable	5
Drag, all steel	4
Grader type	4
Scrapers: Blade, carryall	6
Fresno or Morman	2
Rotary 4; Slip 2; Wheel	5
Screens and bunkers, for gravel pits only	5
Screens, revolving	6
Sharpeners, drill	8
Shears, for steel, hand.	10
Shores, adjustable	4
Shovel attach	6
Shovels: Elec. or gas., crawler or wheel—	
½, ¾ cu. yd	5
1, 1¼, 1½ cu. yd	6
2 cu. yd. and over	8
Steam, craw, or wh—	
½, ¾ cu. yd	7
1, 1¼, 1½, cu. yd	8
2 cu. yd. and over	10
Railroad, steam	10
Tunnel	4
Spouting plants, comp., concrete	4
Spraying equip., paint.	12
Spreaders, stone.	
Hopper wagon	5
Steel box	5
Switches: Portable	4
Stationary	5
Tampers, backfill, pneumatic	3
Tamping machines	10
Tanks: Gasoline, storage and Relay	6
Water or air, storage (steel)	10
Water storage (wood)	14
Tarpaulins and tents	3
Thread cut. mach., pipe	10
Tongs, chain	4
Towers: Cableway—	
Steel 6; Wood	3
Steel boom with counterweights	5
Tractors: Electric—	
3-ton 3; 5-ton 5; 10-ton 6; 20-ton	8
Gas or steam—	
3-ton 4; 5-ton 6; 10-ton 8; 20-ton	10
Trailers:	
Dump—Steel or Wood	10
Platform, wood	4
Drop plat., hvy. duty	5
Transformers, car	10
Trench. mach. (See Excav.)	
Trucks. auto: General purpose or dump—	
½-¾ cu. yd.	3
1-1½ cu. yd.	5
2 cu. yd. & over	8
Tugs, screw-propelled, steam or gas	25
Vises	5
Wagons: Dump—	
Steel or Wood	6
Road oilers, tank, steel	10
Tank or sprinkler—	
Steel 10; Wood	8
Washers, gravel	3
Welders, acet. or elec.	10
Wheelbarrows	2
Winches, elec. and pneu	10
Wire and cables: Elec.	6
Flexible, steel armored	8

Cost to own construction equipment as % of price

Fixed expense per working month just to own construction equipment is expressed in per cent of cost new by the Assoc. Gen'l. Contractors of Amer. in 1949 AGC Manual, Contractors' Equipment Ownership Expense.

This does not cover cost of field repairs, fuel lubricants or other operating cost. It is not a rental schedule.

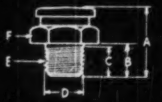
It does cover depreciation (D in table below), overhauling, major repairs, painting (OR), interest, taxes, storage, insurance (IT), total ownership expense (Tot), average use in months per year (U) and expense per working month (E/mo).

A few examples follow, from more than 2500 in this 78-page manual:

	— % of captl investmnt —					
Average annual Ownership Expense	**D %**	**OR %**	**IT %**	**Tot %**	**U/ mo**	**E/ %**
Air comp., port,						
gas, 60 cf	25	15	11	51	6	8.5
gas & Diesel 105 cf	25	15	11	51	6	8.5
gas & Diesel 210 cf	20	15	11	46	6	7.7
stat., elect 46 cf	25	15	11	51	6	8.5
215 cf	20	15	11	51	6	7.7
Air tools, drifter	25	10	11	46	6	7.7
rock drill	33	10	11	54	6	9.0
hose air ¾"	50	10	11	71	8	8.9
receiver	10	10	11	31	6	5.2
sharpener, forge	17	10	11	37	6	6.3
Batcher equip	25	17	11	53	6	8.8
bins, steel-port	20	15	11	46	6	7.7
bins, stl-knockdn	17	15	11	43	6	7.2
Cement plant, bulk	20	15	11	46	6	7.7
Cranes, Crawler						
Dies. 4-T 10′ R	25	10	11	46	8	5.8
6-T 10′ R	20	10	11	41	8	5.1
20-T 12′ R	13	10	11	34	7	4.9
Gas 6-T 10′ R	25	10	11	46	8	5.7
18-T 12′ R	13	10	11	34	7	4.9
Truck, Dies or Gas						
4-T 10′ R	25	15	11	51	8	6.4
8-T 10′ R	20	15	11	46	8	5.8
15-T 10′ R	17	10	11	38	7	5.4
Crusher, Cone or Gyr	10	12	11	33	6	5.5
Crusher, Jaw	17	12	11	40	6	6.7
Dragline, Crawler						
Dies. ½ cy 35′ bm	25	15	11	51	9	5.7
4 cy 75′ bm	15	15	11	41	7	5.9
Elect ½ cy 35′ bm	20	12	11	43	9	4.6
3 cy 60′ bm	10	12	11	33	7	4.7
Gas ½ cy 35′ bm	25	15	11	51	9	5.7
1½ cy 50′ bm	17	15	11	43	7	6.1
Engine,						
Dies. & Clutch 10 hp	15	15	11	41	7	5.9
30 hp	12	12	11	35	7	5.0
165 hp	10	12	11	33	7	4.7
Gas 10 hp	20	15	11	46	7	6.6
45 hp	12	12	11	35	7	5.0
Grader, self propel	20	15	11	46	8	5.8
Hoist, gas doub.-drum	17	10	11	38	8	4.8
Hose	50	10	11	71	7	10.1
Mixer, concrete,						
Gas 3½-S	50	12	11	73	8	9.1
14-S	33	12	11	56	8	7.0
(skids) 28-S	25	12	11	48	8	6.0
elect 3½-S	30	12	11	56	8	7.0
10-S	20	12	11	43	8	5.4
Mixer, truck,						
body & eng 1 cy	33	12	11	56	8	7.0
2 cy	25	12	11	48	8	6.0
incl truck 1 cy	33	16	11	60	8	7.5
2 cy	25	16	11	52	8	6.5
Motor, elect 10 hp	10	10	11	31	7	4.4
200 hp	10	10	11	31	6	5.2
Pump, portable						
centr gas	20	18	11	49	6	8.2
elect	17	15	11	43	6	7.2
diaphr gas	20	20	11	51	6	8.5
elect	17	15	11	43	6	7.2
Rope, wire, ¾"	40	20	11	71	8	8.9
manila ¾"	50	20	11	81	7	11.6
Saw, chain	33	15	11	59	8	7.4
Saw, elect hand	33	10	11	54	8	6.8
Scraper, self loading	20	15	11	46	8	5.8
Shovel, Crawler						
Diesel ½ cy	25	15	11	51	9	5.7
3½ cy	14	15	11	40	7½	5.3
Elect ½ cy	20	12	11	43	9	4.6
2½ cy	10	12	11	33	8	4.1
Gas ½ cy	25	15	11	51	9	5.7
1½ cy	17	15	11	43	8	5.4
Tractor, Crawler						
Dies. 20-33 hp	25	15	11	51	9	5.7
52-62 hp	20	15	11	46	8	5.8
Gas 20-33 hp	33	15	11	59	9	6.6
66-85 hp	20	15	11	46	8	5.8
2-wh, rubber tired	20	15	11	46	8	5.8

Genuine ALEMITE LUBRICATION FITTINGS for Construction Machinery

Insist on genuine Alemite fittings for both new requirements and replacements. Order by Alemite part numbers.



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A-1186

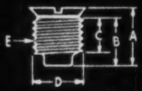
C-69

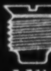
1820

1822-A

1823

1831

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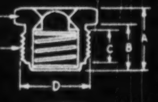

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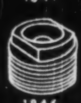
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ALEMITE

Modern Lubrication Methods That Cut Production Costs

Useful Data Sheet to Help You Select and Specify the Right Alemite Fitting for Every Bearing on Construction Equipment.

STANDARD BUTTON HEAD FITTINGS

Part No.	DIMENSIONS					
	A	B	C	D	E	F*
C-69	29/32"	13/32"	9/32"	39/64"	1/8" P.T. Female	5/8"
A-1184	3/4"	11/32"	19/64"	13/32"	1/8" P.T.	5/8"
A-1186	53/64"	27/64"	3/8"	35/64"	1/4" P.T.	5/8"
A-1188	61/64"	31/64"	27/64"	43/64"	3/8" P.T.	3/4"
A-1190	1 5/64"	35/64"	31/64"	27/32"	1/2" P.T.	7/8"
1396	1"	1/2"	13/32"	43/64"	3/8" P.T.	3/4"
1401	53/64"	27/64"	3/8"	35/64"	1/4" P.T.	5/8"

*Wrench Size.

GIANT BUTTON HEAD FITTINGS

Part No.	DIMENSIONS					
	A	B	C	D	E	F*
1820	1 1/16"	1/2"	13/32"	27/32"	1/2" P.T.	7/8"
1821	1 5/16"	9/16"	7/16"	5/8"	5/8"-18 Thd.	7/8"
1822-A	1 5/16"	9/16"	29/64"	43/64"	3/8" Spec. P.T.	7/8"
1823	1 1/4"	1/2"	3/8"	35/64"	1/4" P.T.	7/8"
1825	2"	41/64"	11/32"	43/64"	3/8" P.T.	7/8"
1831	1 5/32"	3/8"	9/32"	13/32"	1/8" P.T.	7/8"
**1871-A	1 5/16"	9/16"	29/64"	43/64"	3/8" P.T.	7/8"
**1872-A	1 1/4"	1/2"	3/8"	35/64"	1/4" P.T.	7/8"

*Wrench Size. **1871-A and 1872-A have special construction to withstand extremely high pressures. Recommended for use on lubricated valves.

FLUSH TYPE FITTINGS

Model No.	A	B	C	D	E
†Z-730-A	7/16"	3/8"	....	5/16"	....
Z-741-A	9/16"	15/32"	7/16"	35/64"	1/4" P.T.
1452	1/2"	29/64"	29/64"	13/32"	1/8" P.T.
†1814	21/64"	9/32"	....	5/16"	....
1815	23/64"	9/32"	9/32"	13/32"	1/8" P.T.
†1817	11/32"	19/64"	....	3/8"	....
†1853	11/32"	19/64"	....	1/4"	....

†Drive Fittings.

GIANT FLUSH TYPE FITTINGS

Model No.	A	B	C	D	E	F*
1840	49/64"	39/64"	31/64"	5/8"	5/8"-11 Thread	3/4"
1841	49/64"	39/64"	31/64"	43/64"	3/8" P.T.	3/4"
1842	55/64"	39/64"	1/2"	27/32"	1/2" P.T.	7/8"
1843	7/8"	39/64"	1/2"	1 3/64"	3/4" P.T.	1 1/8"
1844	7/8"	5/8"	31/64"	1 5/16"	1" P.T.	1 3/8"
**1846	49/64"	19/32"	19/32"	1 3/64"	3/4" P.T.	11/16"
**1847	55/64"	39/64"	1/2"	27/32"	1/2" P.T.	3/4"

*Wrench Size. **Flush Fit No Hex.

FREE REPRINTS—You may obtain a complete set of these data sheets covering all Alemite Fittings.

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STEWART WARNER

Welding Construction Costs Compared

FEW FACTS on welding costs are available in construction costs literature. It is possible that if more were known about estimating costs of welded construction, and if more comparative data were available on welding construction costs that welding would be more widely used.

Working on this theory, an advocate of the economies of welding, Van Renssalaer P. Saxe, consulting engineer of Baltimore, has made available four examples of steel beam and girder building construction for which alternate bids on welding and riveting were taken. Welded tonnage on these buildings ran 8 to 10% under the riveted, unit price per ton ran from no saving to 8% lower for welding. This combination produced overall cost saving on the steel ranging from 8 to 11%.

Mr. Saxe selected these examples because beam and girder construction offers less opportunity for cost saving than do trusses. On long-span trusses for garages and factories, welding has produced savings of over 20%.

Most jobs in Mr. Saxe's office are laid out for welded construction with an alternate allowing riveting if the contractor prefers. In only two instances in over 200 jobs has a fabricator elected to rivet instead of weld. A properly designed welded job should be at least 5% cheaper than a similar riveted or bolted job.

The accompanying tables show the conditions, quantities and unit prices on which the welding savings ratios are based. These were all based on contractors bids.

For preliminary cost estimating unit costs on welding are not available. Fabricators know their own overall costs, but these are not available, analyzed by size of weld.

For rough estimating the following costs have been averaged by checking selected samples groups of shop and field welders:

Welding labor and material costs—per lineal foot

(overhead not included)

Size of Weld	Cost per lf Shop	Cost per lf Field
¼" fillet	$1.05	$1.35
⅜" fillet	1.25	1.60
½" fillet	1.50	1.90
⅝" fillet	1.95	2.35

Building 1

Owner: Chesapeake & Potomac Telephone Co. of Virginia, Richmond, Va.
Size: 9 floors. Designed for 7 additional floors 93'-0" x 112'-10"
Design: Steel frame, continuous moment design, fully wind-braced
Contractor: American Bridge Co., Steel, Doyle & Russell & Wise Contracting Co., General
Architect: Merrill C. Lee
Engineers: C. E. Dennis, C&P Telephone Co.
Van Rensselaer P. Saxe, consultant

Building 2

Owner: Globe Brewing Co., Baltimore, Md.
Size: 73'-0" high, 30'-0" x 57'-0"
Design: Steel grain bin building
Contractor: Eastern Iron & Steel Co., Baltimore, Md. fab. and erect.
Charles R. Scrivener Co., Inc., Baltimore Md., Builder
Engineer: Van Rensselaer P. Saxe, Baltimore, Md.

Building 3

Owner: Bendix Radio Corp., Towson, Md.
Size: 50' x 450'
Design: Addition. 2nd floor & roof are steel construction, first floor on ground
Contractor: Maryland Steel Products Co., Baltimore, Md. Fab. & erect.
The Davis Construction Co., Baltimore, Md., general
Engineer: Van Rensselaer P Saxe, Baltimore, Md.

Building A

Owner: University of Maryland, College Park, Md.
Size: 5 levels, 68'-0" high 67' x 51'
Design: Boiler house, structure supports stack
Contractor: Maryland Steel Products Co., Baltimore, Md. Fab. & erect.
Burnap Owens Construction Co. College Park, Md., General
Engineer: Van Rensselaer P. Saxe, Baltimore, Md.

WELDED STEEL COSTS COMPARED WITH RIVETED BEAM AND GIRDER CONSTRUCTION

	Date Built	Tons Welded	Tons Riveted	Welded Tonnage % lower	Price Welded	Per Ton Riveted	Welded Price % lower	Saving	Cost Saving %
Building 1	(1948)	1217	1325	8	$197	$181–187	5 to 8	$21,000	8
Building 2	(1948)	201	223	10	287	290	1	6,000	9
Building 3	(1947)	182	204	11	200	200	0	4,400	11
Building 4	(1947)	83	92	10	296	301	1.66	3,000	11

Street Resurfacing Cuts Costs

Instead of replacing worn pavements, Baltimore has surfaced 350 miles of them during the past two years, adding many years of life at relatively low annual square yard charges. So attractive is the practice, William L. Chilcote, deputy highways engineer of Baltimore reported to the American Road Builders Association early this month, that the city makes resurfacing an integral part of its pavement planning, even for new work. Thus the city lays 9-in. concrete slabs for main arterial streets and 7-in. slabs for residential streets, but adds no surface until the concrete wears enough to require maintenance. Then a 2-in. layer of either sheet asphalt or bituminous concrete is applied.

When a resurfacing job is to be undertaken, necessary base repairs are made, and the manhole structures raised. Where car tracks are to be abandoned the rails are "choked" with hot asphalt topping and rolled in. The entire roadway is then given a tack coat of asphalt emulsion, and the low irregular spots leveled up with bituminous binder. After this a hot plant-mixed bituminous binder is placed, lane by lane, to a depth of about 1 in., with a good crown and feathered out at the edges. Finally, a surface coat is applied which, when compressed, will have a thickness of about an inch.

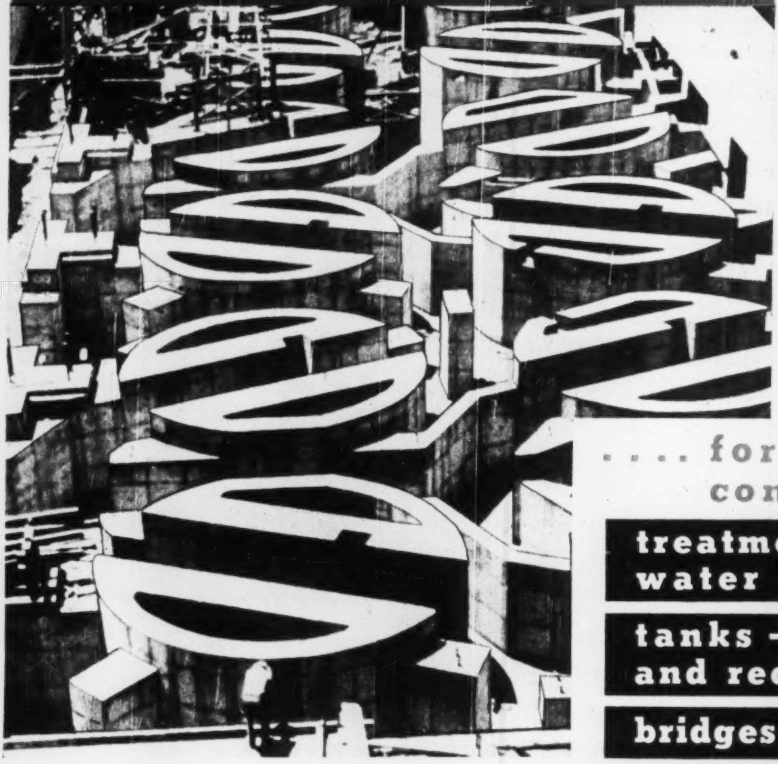
The cost of the resulting street is only a fifth to a quarter the cost of total reconstruction, either initially or on a basis of cost per square yard per year of service as shown in the accompanying table based on Baltimore experience and prices. For example, a 9-in. slab that would cost $8.50 per sq yd would cost $0.243 per sq yd per yr based on a life expectancy of 35 years. If it should be surfaced with sheet asphalt at the end of 20 years its life would be prolonged to at least 45 years at a relative cost of $0.227 per sq yd per yr. The same highway could be resurfaced at the end of 45 years adding another 20 years to its life bringing the cost per sq yd per year down to $0.183. And still another surfacing would add 15 more year of life, making a total of 80, and giving sq yd cost per yr of $0.17.

The same technique can be applied to a 7-in. pavement with a life expectancy of 25 years. Two resurfacings can lengthen this life to 50 years and reduce the cost per sq yd per yr from $0.24 to $0.18. By adopting these techniques Mr. Chilcote says "our existing pavements can be conserved, and we will ultimately realize the greatest useful return from our investment." He cites the 6 million sq yd of of pavement that Baltimore has rehabilitated as proof.

How resurfacing cuts annual street costs

Type of Pavement	Cost/ sq yd	Est. Life yrs	Unit Cost/ sq yd/yr
9" concr, unsurf	$8.50	35	$0.243
9" concr, with	8.50	20	
2" S.A. surfg	1.70	25	
Total	10.20	45	0.227
9" concr, with	8.50	20	
2" S.A. surfg and	1.70	25	
2" S.A. re-surfg	1.70	20	
Total	11.90	65	0.183
9" concr, with	8.50	20	
2" S.A. surfg,	1.70	25	
2" S.A. re-surfg &	1.70	20	
2" S.A. re-surfg	1.70	15	
Total	13.60	80	0.170
7" concr, Unsurfaced	6.00	25	0.24
7" concr,	6.00	15	
2" B.C. surfg	1.50	20	
Total	7.50	35	0.214
7" concr with	6.00	15	
2" B.C. surfg and	1.50	20	
2" B.C. re-surfg	1.50	15	
Total	9.00	50	0.180

Economy STEEL FORMS. . . . .



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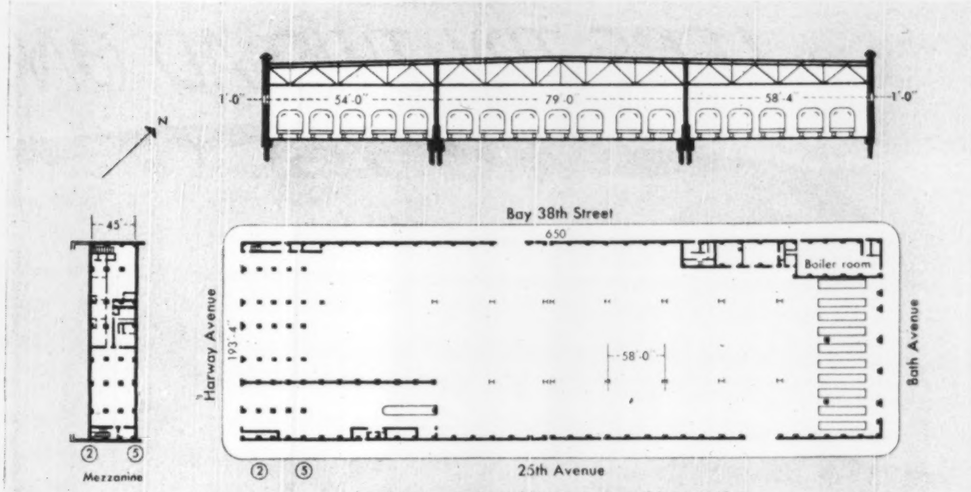


Ulmer Park Bus Garage, Brooklyn, N.Y.
Contracts let Sept., 1948, completed and in service Jan., 1950

Construction cost, municipal bus garage, New York, N. Y.

THE ULMER PARK bus garage in Brooklyn was built by New York City's Board of Transportation for $0.56 per cu ft, $12.51 per sq ft. Equipment for fueling, washing, inspection and light maintenance brought the overall cost for housing and servicing 185 buses up to $0.63 per cu ft of enclosed space, $13.53 per sq ft of floor area.

An unusually detailed analysis of these construction costs has been made by Alfred Brahdy, division engineer, Board of Transportation, Engineering Department, Division of Designs, which shows also the conditions and facilities provided that define and qualify the cost data.

The first contract was awarded in September, 1948, when the ENR building cost index was 357. It is now, February, 1950, 356. Structural steel contract followed in Oct. 1948.

This building started with a clear site, an advantage credited with trimming unit costs 12% below costs of a preceding bus garage where site conditions were not so favorable. This saving was made in spite of the fact that the contract was awarded at the peak of the postwar price rise and that it provided for wood piling that cost 1.9c per cu ft and 42c per sq ft.

Heating and ventilating cost 9.9c per cu ft, electric power, lighting and communications 4.6c, plumbing 2.5c. The largest single item in the cost analysis is the steel, 12.2c per cu ft.

Wage rates prevailing when this work was contracted include, for 6-hr day, plasterers $3.20, electrical workers $2.50; for 7-hr day, bricklayers $3.20, carpenters $2.75, steamfitters $2.75, plumbers $2.81; for 8-hr day, structural iron workers and hoisting engineers each $3.00 and common labor $1.70 per hr. Structural steel at the mill was $3.25 per cwt.

Previously unit prices have been reported for the East New York bus garage, Brooklyn, contract May, 1948, in ENR Sept. 30, 1948, p 83. These were on a different basis, itemized per ton of steel, per cu yd of excavation and concrete, per sq yd of plaster.

Ulmer Park Bus Garage—Construction costs per square foot and per cubic foot

Description of building

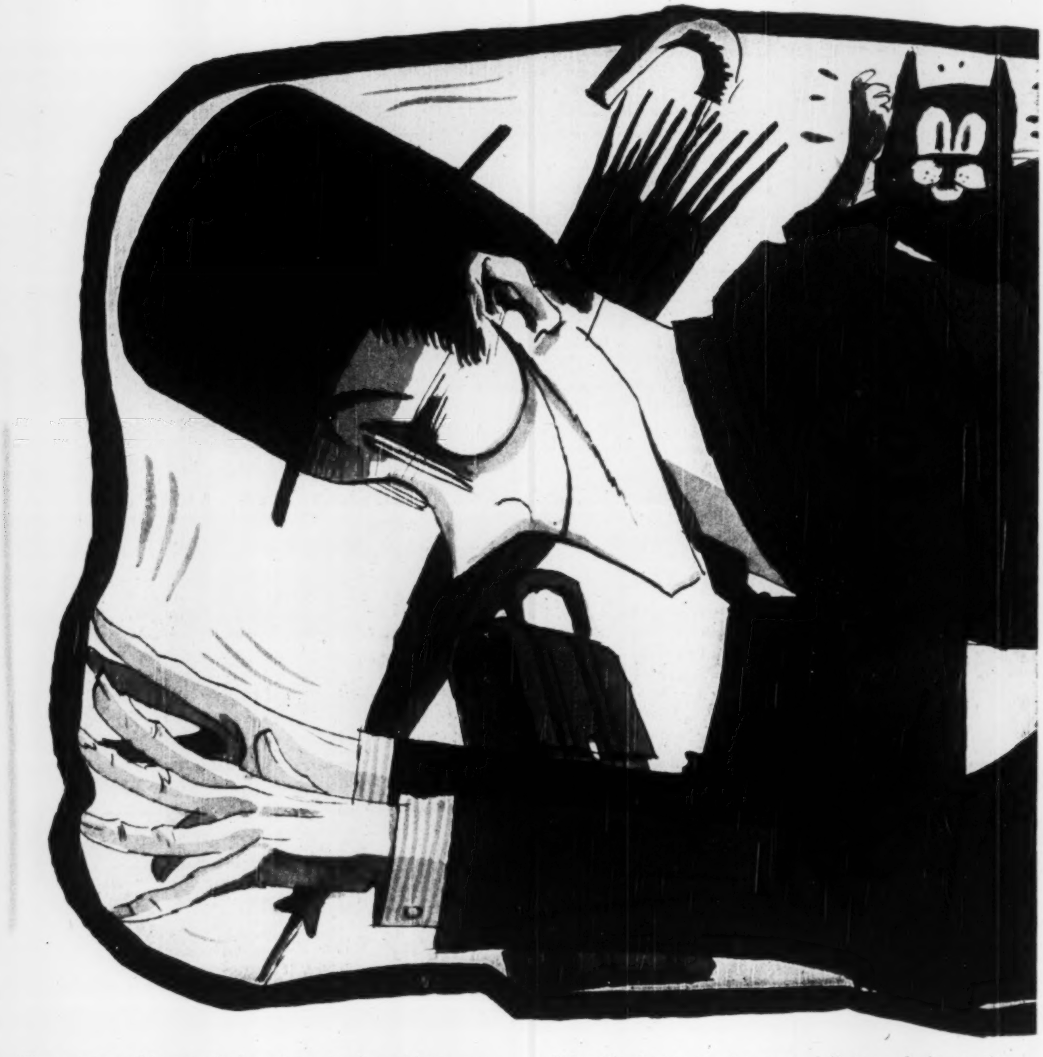
One-story building 193'-4" x 650' at 25th & Harway Avenues, Brooklyn.
Headroom 16 ft., column spacing 53 x 54, 79 and 58.
Warren type roof trusses.
Three 250 H.P. Boilers. Heating & Vent. by pressure supply & mech. exhaust.
Fluorescent Lighting.
Full Sprinkler Protection.
Storage, fuel and washing facilities for 185 buses.
Inspection and light maintenance repairs.
Volume: 2,802,800 cf. Plot Area: 125,700 sf.
ENR Building Cost Index 357, Sept. 1948.

Contr. No.	Date Del.			Amount of Bid
1	9-13-48	Foundation	Peerless Const. Co	$102,100
2	10- 8-48	Struct. steel	Harris Struct. Steel Cons. Co. Inc	240,100
3	4-26-49	Gen. const.	Atlas Tile & Marble Wks. Inc	808,900
4	4-25-49	Plumbing	Breakstone Plumbing & Heating	66,200
5	4-28-49	Sprinklers	Pipe & Engr Co. Inc	50,400
6	5-23-49	Elect. equip.	McNutt Elect. Co. Inc	129,500
7	6- 6-49	Heating & vent	Raisler Corp	268,900
E-75	9-13-49	Fuel dispensers	Bowser, Inc.	34,700
Total				$1,700,600
Total cost per bus				$9,200

Class of construction	Cost	Cost per Sq Ft	Cost per Cu Ft
Excavation and earth fill	$41,300	$.33	$.015
Wood piles	52,300	.42	.019
Steel & iron items	347,500	2.77	.123
Brick & coping	151,400	1.20	.054
Concrete items	182,600	1.45	.065
Heating & ventilation	277,600	2.21	.099
Elect power, lighting, telephone & fire alarm	129,500	1.03	.046
Plumbing, plumbing fixtures, leaders, etc.	68,700	.55	.025
Sprinkler system	50,500	.40	.018
Precast roof slabs	75,000	.60	.027
Roofing & insulation	85,600	.68	.031
Doors, windows, stairs, etc.	61,700	.49	.022
Floor finish, partitions, tile & plaster	48,300	.38	.017
Subtotal, Cost of Building	$1,572,000	$12.51	$.56
Hoists, washing machines, brake tester	$77,000	$.61	.028
Bus fuel dispensing & lubricating systems	51,600	.41	.018
Total, Cost with equipment	$1,700,600	$13.53	$.61
Assessed value of land (1948)	$55,100		

This construction cost analysis is based on contract quantities, bid prices and work orders. Building completed and put in service January 1950.

LET'S TRY THIS AD ON



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"And I have to climb a ladder to shave myself.

"You see, in the last 4 years American Mutual and I have almost *doubled in size!*

"And if I'm fairly bustin' out of this ad, it's because so many people have discovered that we're the savingest, servingest folks they can come to . . .

"They like the opportunity to get *a dollar's worth of protection* for 80 cents, on most forms of insurance . . .

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"And they especially like our Specialized Engineering Service, which has demonstrated year after year that we can help contractors reduce costly accidents, and speed construction at the same time.

AMERICAN MUTUAL . . . **the first American liability insurance company**

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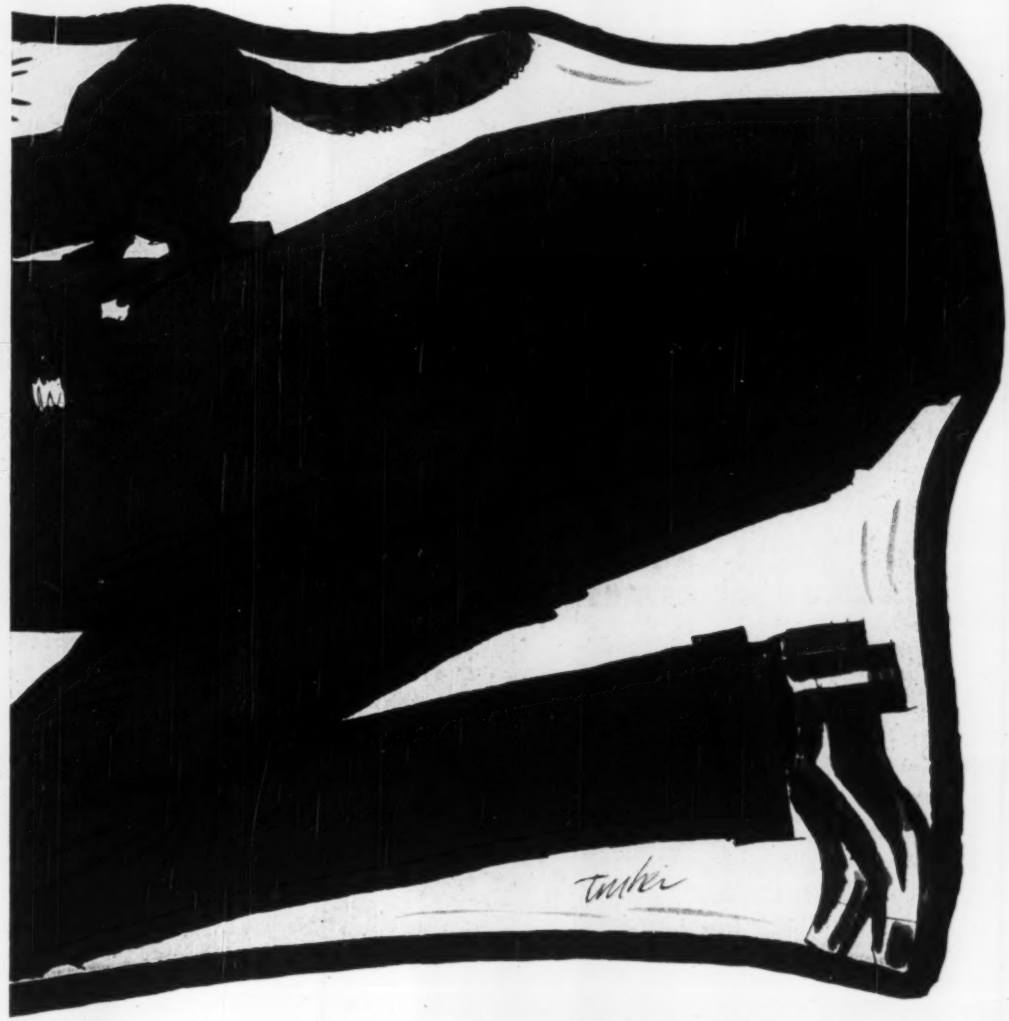
FOR SIZE . . . by Mr. Friendly



"The point is . . . the bigger we are, the bigger job we can do for you. With 73 offices from coast-to-coast, we're right next door to you when trouble comes . . . ready and eager to help . . .

"So that you'll recommend us to more people . . . so we'll grow bigger . . . so we can do a better job for them . . . so they'll recommend us to more people . . . so. . . .

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City ____________________ *State* ______________

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103 GEIST ROAD • ERIE, PENNSYLVANIA

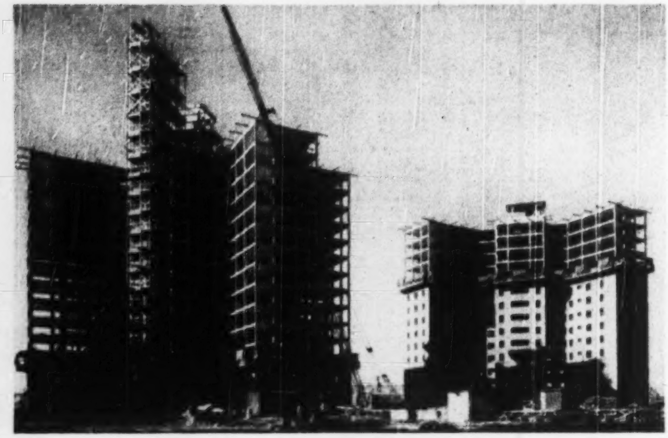
Average bid prices for highway construction by states—fourth quarter, 1949

Projects Utilizing Federal-Aid Highway Funds—Bureau of Public Roads, General Services Administration

	U. S.	New England						Middle Atlantic						Southern												
CLASS OF CONSTRUCTION	Av.	Me.	N. H.	Vt.	Mass.	R. I.	Conn.	N. Y.	N. J.	Penn.	Md.	D. C.	Del.	Va.	W. Va.	N. C.	S. C.	Ga.	Fla.	Ala.	Miss.	La.	Ky.	Tenn.	Hawaii	P. R.
Roadway Excavation, per cu. yd.																										
Borrow	0.55	0.45	.....	1.18	0.44	0.50	0.40	0.60	0.51	0.83	.....	1.79	.....	0.59	0.68	0.33	.....	.....	.....	0.46	.....	0.40	0.50	0.43	2.78	0.73
Common	0.32	0.44	.....	0.42	0.28	0.60	0.69	.....	0.52	.....	.....	.....	.....	.....	0.62	.....	0.35	0.31	.....	0.23	.....	0.38	.....	.....	.....	.....
Unclassified	0.45	0.48	.....	1.68	0.86	.....	.....	0.70	0.61	1.16	.....	1.49	.....	0.44	0.55	0.29	0.33	0.36	0.30	0.24	0.25	.....	0.57	0.62	0.41	0.44
Rock, Solid	1.06	3.06	.....	2.63	1.79	.....	3.00	.....	5.75	.....	.....	.....	.....	.....	20.80	.....	.....	.....	.....	1.00	.....	.....	.....	.....	.....	.....
Structural Excavation, per cu. yd.																										
Common, Dry	2.75	1.51	.....	.....	1.59	3.00	.....	.....	.....	.....	.....	.....	.....	4.04	2.93	4.20	.....	.....	.....	.....	.....	.....	3.72	5.78	.....	.....
Unclassified	3.65	.....	.....	30.85	12.00	.....	3.55	2.62	5.00	3.99	.....	.....	.....	6.45	2.25	2.10	.....	3.63	.....	3.36	.....	.....	9.77	3.02	2.88	3.19
Steel, per lb.																										
Pavement Reinforcement	0.071	.....	.....	.....	.....	.....	0.074	0.070	.....	0.066	.....	0.102	.....	0.099	0.125	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Structural Reinforcement	0.098	0.108	.....	0.100	0.087	0.084	0.100	0.123	0.150	0.101	.....	.....	.....	0.124	0.114	0.086	0.086	0.093	0.092	0.098	0.100	0.098	0.104	0.103	0.101	0.118
Structural Steel	0.120	.....	.....	0.141	0.111	0.104	0.124	0.136	0.191	0.124	.....	.....	.....	0.108	0.140	0.085	0.092	0.099	0.130	0.102	0.112	0.123	0.500	0.300	.....	.....
Bases, per sq. yd.																										
Gravel and Clay Gravel	0.29	0.49	.....	0.69	.....	.....	0.47	0.35	0.46	0.78	.....	.....	.....	0.35	.....	.....	.....	0.22	0.32	0.27	.....	0.46	.....	0.14	.....	0.49
Macadam or Stone A	0.85	.....	.....	3.00	0.71	0.65	1.67	1.03	1.55	2.00	.....	.....	.....	0.97	0.91	0.96	1.54	1.02	0.95	.....	.....	.....	1.65	1.59	2.09	0.41
Portland Cement Concrete B	3.74	.....	.....	.....	.....	.....	.....	3.43	3.60	6.03	.....	3.79	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Surfaces per sq. yd.																										
Gravel and Clay Gravel	0.13	.....	.....	.....	.....	.....	0.31	.....	0.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.13	.....	0.25	.....	.....	.....
Bituminous Surface Treatment A	0.24	0.17	.....	0.27	.....	.....	0.43	.....	.....	0.91	.....	.....	.....	0.18	0.83	0.37	0.36	0.33	0.27	0.22	.....	0.39	.....	.....	.....	0.25
Bituminous Road Mix A	0.42	0.36	.....	1.09	.....	.....	.....	.....	.....	0.80	.....	.....	.....	0.35	.....	.....	.....	2.00	0.79	.....	.....	.....	.....	.....	.....	.....
Bituminous Intermediate Surfaces A	0.68	0.98	.....	.....	0.78	.....	1.13	1.29	1.46	1.20	.....	.....	.....	.....	.....	0.58	0.66	0.54	.....	.....	.....	.....	.....	.....	.....	.....
Bituminous Concrete A	0.97	1.11	.....	1.32	0.93	1.40	0.86	1.72	0.66	1.33	.....	1.50	.....	.....	1.02	0.25	.....	1.12	0.92	.....	.....	.....	1.37	0.55	1.32	.....
Portland Cement Concrete B	3.59	.....	.....	.....	.....	.....	3.71	4.07	4.55	4.85	.....	4.16	.....	2.59	3.17	.....	.....	3.64	.....	.....	.....	3.04	.....	5.32	4.32	3.60
Pipe per lin. ft.																										
Cast Iron, 18-Inch	8.83	.....	.....	.....	.....	.....	.....	7.34	10.40	8.96	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clay, 6-inch	1.40	0.80	.....	.....	1.00	3.00	.....	1.36	.....	1.61	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Concrete Reinforced, 24-inch	4.89	4.72	.....	4.83	5.25	.....	.....	6.21	6.21	6.70	.....	.....	.....	4.85	4.17	4.23	3.93	3.82	4.30	4.47	4.91	4.89	4.41	4.76	7.34	4.88
Galvanized Iron, 24-inch	4.61	4.60	.....	4.85	.....	.....	.....	7.11	.....	5.65	.....	.....	.....	4.64	.....	4.87	.....	4.32	3.71	3.25	.....	.....	5.17	3.00	.....	.....
Structural Concrete, per cu. yd.																										
Superstructures	46.34	38.14	.....	50.00	34.43	50.00	46.55	50.68	81.89	51.33	.....	.....	.....	50.67	60.03	45.71	42.52	45.78	53.70	33.32	42.17	51.47	47.92	63.94	55.05	37.10
Substructures	42.22	35.97	.....	56.96	28.91	32.09	34.91	37.72	77.44	38.13	.....	.....	.....	51.11	46.10	44.09	48.65	42.65	47.65	29.55	36.69	.....	42.29	44.67	48.04	35.81
Foundations and Footings	45.13	.....	.....	52.57	28.33	22.89	34.92	37.67	134.30	.....	.....	.....	.....	48.02	41.35	49.49	42.09	45.07	48.88	48.51	.....	.....	.....	48.37	.....	16.83

	Middle West					West of Mississippi													Far West							
CLASS OF CONSTRUCTION	Ohio	Ind.	Ill.	Wisc.	Mich.	Minn.	Iowa	Mo.	Ark.	N. D.	S. D.	Neb.	Kans.	Okla.	Tex.	Mont.	Wyo.	Colo.	N. M.	Idaho	Utah	Ariz.	Nev.	Wash.	Ore.	Cal.
Roadway Excavation, per cu. yd.																										
Borrow	0.54	0.73	0.83	0.35	0.45	0.30	.....	0.35	0.31	.....	.....	.....	.....	.....	0.41	0.87	0.74	1.07	.....	0.50	.....	1.22	0.42	0.59	.....	0.81
Common	.....	0.42	0.67	0.26	0.25	.....	0.21	0.41	0.29	.....	.....	.....	0.24	.....	0.30	.....	.....	.....	.....	.....	.....	.....	0.37	0.31	0.41	.....
Unclassified	0.56	.....	1.98	0.27	.....	0.16	.....	1.25	0.60	0.15	0.18	0.18	0.19	0.33	0.33	0.28	0.26	0.65	0.65	0.40	0.33	0.71	0.55	0.64	0.83	0.47
Rock, Solid	.....	.....	.....	0.85	2.29	.....	.....	0.65	1.03	.....	.....	.....	0.77	.....	0.75	.....	.....	.....	.....	.....	.....	.....	0.86	1.20	0.78	.....
Structural Excavation, per cu. yd.																										
Common, Dry	1.68	.....	.....	1.00	2.65	2.27	3.73	5.62	2.31	1.82	.....	.....	6.00	6.02	.....	1.99	4.08	2.30	.....	2.23	1.58	.....	.....	.....	.....	.....
Unclassified	3.40	.....	10.75	7.46	2.15	21.12	4.82	2.77	2.11	15.00	3.95	2.11	2.58	1.47	3.66	6.35	3.10	.....	2.29	2.19	.....	2.81	2.28	2.38	5.68	2.84
Steel, per lb.																										
Pavement Reinforcement	0.074	.....	0.065	0.096	0.057	.....	.....	.....	0.077	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Structural Reinforcement	0.091	0.093	0.092	0.097	0.078	0.120	0.102	0.113	0.105	0.115	0.100	0.120	0.105	0.093	0.087	0.131	0.122	0.121	0.100	0.102	0.115	0.123	0.144	0.104	0.100	0.076
Structural Steel	0.112	0.104	0.108	0.130	0.109	0.135	0.112	0.133	0.121	0.120	0.206	0.159	0.119	0.114	0.091	0.172	0.140	0.139	.....	.....	0.245	0.156	0.200	0.144	0.155	0.091
Bases, per sq. yd.																										
Gravel and Clay Gravel	0.75	1.25	0.52	0.25	0.35	0.09	0.06	0.53	0.35	0.20	0.22	.....	0.47	0.61	0.24	0.22	0.21	0.25	0.30	0.27	0.27	0.36	0.16	0.45	0.49	0.33
Macadam or Stone A	1.23	.....	1.87	.....	.....	.....	.....	1.25	.....	.....	.....	.....	0.81	.....	.....	.....	.....	.....	0.36	.....	.....	.....	.....	0.27	0.54	.....
Portland Cement Concrete B	4.16	.....	4.11	.....	3.88	.....	.....	3.66	3.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Surfaces per sq. yd.																										
Gravel and Clay Gravel	.....	.....	0.31	0.09	0.18	0.07	0.07	0.14	0.44	0.09	0.13	0.11	0.08	0.21	.....	0.16	0.13	0.16	0.16	.....	.....	0.11	0.29	0.18	.....	.....
Bituminous Surface Treatment A	.....	.....	0.44	0.18	.....	.....	.....	0.22	0.34	.....	0.29	.....	0.18	0.35	0.16	0.15	.....	.....	0.17	0.15	.....	0.26	.....	0.25	.....	.....
Bituminous Road Mix A	0.50	.....	.....	0.26	0.50	.....	.....	0.52	0.52	.....	0.80	.....	0.55	.....	.....	0.46	0.37	0.53	0.37	0.39	0.34	.....	0.36	.....	.....	0.30
Bituminous Intermediate Surfaces A	0.49	.....	1.77	.....	.....	.....	.....	0.20	.....	.....	0.76	.....	.....	.....	.....	0.79	.....	1.49	.....	.....	0.69	0.57	.....	.....	0.44	0.73
Bituminous Concrete A	1.25	.....	2.05	.....	1.00	.....	.....	0.78	0.58	0.86	.....	.....	.....	1.76	0.34	.....	.....	.....	.....	.....	.....	.....	.....	1.27	1.15	.....
Portland Cement Concrete B	3.93	3.75	4.19	.....	2.62	.....	5.63	3.06	3.53	.....	4.91	3.51	3.05	2.91	2.74	.....	.....	3.44	.....	.....	.....	.....	.....	.....	3.60	2.79
Pipe per lin. ft.																										
Cast Iron, 18-Inch	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clay, 6-inch	0.97	.....	.....	.....	0.76	.....	.....	.....	.....	4.65	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.00
Concrete Reinforced, 24-inch	5.18	.....	5.79	4.29	4.05	4.58	5.17	6.14	4.34	4.77	4.53	.....	4.19	4.20	4.00	6.03	5.93	.....	.....	9.00	5.37	.....	.....	5.00	4.60	5.30
Galvanized Iron, 24-inch	4.41	.....	4.60	3.60	3.79	5.00	3.88	4.43	4.07	4.87	4.78	4.34	4.09	4.09	4.69	5.71	3.98	4.97	4.82	4.38	4.08	5.60	3.95	.....	5.22	4.27
Structural Concrete, per cu. yd.																										
Superstructures	52.41	55.78	66.61	47.34	35.50	53.62	41.02	56.73	40.29	46.99	51.78	56.65	43.94	33.98	33.56	73.55	49.91	41.63	.....	48.47	.....	44.16	70.00	65.38	58.24	44.24
Substructures	44.99	51.39	44.72	43.85	34.64	54.78	40.68	46.94	49.59	49.61	52.72	41.51	36.61	37.11	31.91	72.07	48.36	48.65	46.23	60.98	55.56	55.00	50.06	41.61	60.64	.....
Foundations and Footings	40.50	40.64	65.24	43.62	.....	57.70	.....	80.00	.....	49.21	50.00	.....	.....	37.20	.....	.....	.....	45.30	50.00	.....	55.56	.....	.....	37.17	56.06	24.99

Rates shown are the weighted average bid prices for the contract quantities reported. *A Incl prime and seal asphalt and tar. *B Adjusted to incl cost of fine finishing of subgrade and excl cost of steel & joints.



How to Build Housing Economically, Fast

John P. Riley, Director of Development of the New York City Housing Authority, offers six important principles that can help you turn out better apartment houses at less cost to you and the owner.

SINCE THE WAR, the New York City Housing Authority has constructed 42 projects. In 1949 alone, 16 projects were started. This huge program presented an unusual opportunity to develop—and prove—design and construction techniques for building faster and more economically.

Last year especially, conditions were favorable for testing and evaluating these techniques. The year 1949 was unprecedented in the history of the Authority. Not only was it a record year in construction activity, but also it marked a reversal in the trend of construction costs. For the first time since the end of World War II costs moved downward.

The 16 projects—incorporating 15,556 apartments—on which the Authority took bids during the year cost a total of $170 million; $125 million were in construction contracts alone. At the end of the year, the Authority had under construction 24 projects with 24,180 apartments, representing $278 million worth of housing. These projects will house nearly 86,000 persons—equivalent to the population of Schenectady, N. Y., or Harrisburg, Pa.

The speed at which this vast program was implemented made it possible for the Authority to take advantage quickly of the breaks in a constantly changing price market.

But this does not mean that stereotyped plans were used, or that research and ingenuity were sacrificed in the planning. The projects represent various standards of living: The fully subsidized projects rent for less than $9 per room, including utilities, whereas veterans' housing without cash subsidy rents for about $16 per room, including utilities.

The speed was achieved by detailed scheduling and organization. Economy was obtained by applying six principles that experience showed to be highly significant in the cost picture.

1

Simple units are most economical.

In the search for economical plans that incorporate good living conditions, the Authority found that certain basic features of a building exert a predominant influence on the over-all merit of the plan: Vertical facilities, such as stairs, elevators and risers, must be arranged to greatest advantage; and horizontal areas must be laid out for the most efficient use.

The latter process, in producing the most efficient core of a building, greatly affects the over-all cost because of the effect of the core on such elements as perimeter and wall surfaces. Since about 50% of the cost of a building goes into foundations, frame and envelope, it can be seen how careful the designer must be to achieve maximum efficiency.

Over the years, it has been shown forcibly that novelty is no substitute for sound planning. The simpler the unit, and the more closely it approaches a square or rectangle, the more likely it is to be both economical and well laid out.

2

Cost and efficiency are controlled by a few elements.

To determine as quickly as possible the relative merits of plans under consideration, the Authority developed a method of analyzing cost and efficiency based on the following elements: floor area, roof area, cellar area, perimeter, foundation walls, linear feet of partitions, number of stairs, number of incinerators, number of elevators, and number of plumbing stacks.

These elements were selected because, in the aggregate, they control the cost of the building. A unit that emerges as the most economical from such a study can be assumed to be the most economical; the designer can make this assumption safely, without waiting for full working drawings.

These studies have produced interesting results. A typical example is a project in which a choice had to be made between a plan based on a unit with four apartments per floor and an alternative plan based on a unit with five apartments per floor. It would be natural to assume that the latter would be more economical. However, a detailed analysis, in which only the cost-controlling elements were considered, showed quite clearly that the plan with fewer apartments per floor would be no more costly—either on a cost per cubic foot or cost per apartment basis (Table I).

Consequently, the plan with four apartments per floor was chosen. In this way, at no extra cost, the Authority secured a much better apartment layout insofar as living conditions were concerned.

3
Bids should be scheduled to foster maximum competition.

The need of such short-cut analyses is great, because the volume of work to be produced makes it essential that decisions be given as quickly and as accurately as possible. It also is necessary to establish, months in advance, the dates on which bids are to be taken.

The work must be released for bidding in a sequence that will promote maximum competition and yet allow ample time for bidding. At the same time progress of the projects can not be held up.

To obtain these objectives on Authority jobs, production schedules for the design were set up as soon as the preliminary plans were approved. Periodic meetings were held with the design team—the architects and their consultants—to settle current questions and to maintain the required progress.

4
Standard specifications expedite design and erection.

Standard specifications should be developed, covering the basic features of the buildings as normally constructed. Then, it is necessary only to insert certain amendments in contracts or standard specifications to adapt them to a specific project.

As a result, architects, engineers and contractors become familiar with certain standards, which remain constant, and progress is expedited on both design and construction. Chances of mistakes or confusion thus are minimized.

Contractors bidding on Authority work could rely on uniform standards and consistent interpretation of contracts and specifications, so that the usual contingency item present in lump sum bidding was reduced to a minimum.

5
Cooperation with contractors pays off.

Equal care must be taken in organizing for the bidding and construction period. On these projects, Authority representatives met with groups of contractors to discuss the effect of proposed contract requirements on speed and cost. Meetings of prospective prequalified bidders were held regularly in advance of the taking of bids, so that everyone would clearly understand the intent and scope of the bid documents.

All possible means of advancing the start of construction were used. Foundation contracts were let in advance wherever such action furthered this objective. If difficulties of clearing tenants from a site made it impossible to get access to the entire area at an early date, the project was divided into sections.

After contracts are awarded, progress schedules for each trade must be set up and carefully correlated. On an Authority project, when the first building was enclosed, a supplementary schedule—trade by trade and floor by floor—was set up so that the rate of progress toward the desired occupancy date could be checked at any time.

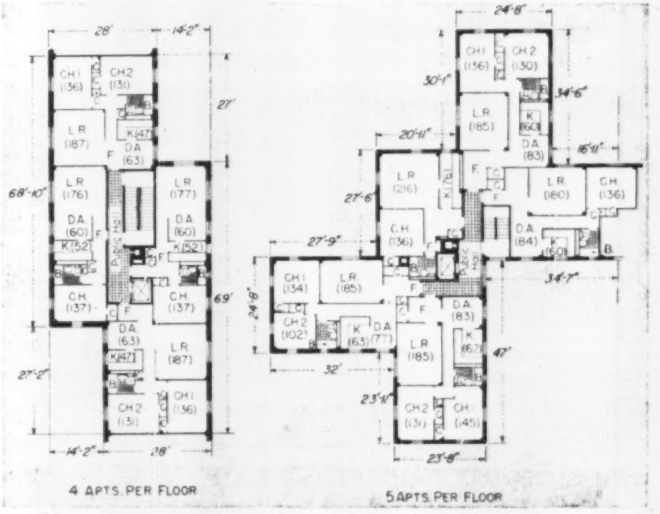
Another valuable point of cooperation with contractors was an expediting service. Knowing that availability of materials directly affected construction cost estimates of prospective bidders, the Authority, after the war, set up its own staff of expediters to assist contractors in securing adequate supplies to keep jobs moving. This service was continued until a free flow of materials made it unnecessary.

From the information that thus became available, it was possible to learn first-hand of any change in the material situation. Experience indicated that the change from scarcity to plenty took place in a relatively short time—the last quarter of 1948. The effect on costs was almost instantaneous (as shown by the cost charts covering the Authority's construction bids), so that the rising trend was arrested at the beginning of 1949. It may well be that this reversal occurred earlier in the Authority's operations than in the industry generally. If so, it can logically be attributed to the unusually close working relationship between the Authority and the construction industry.

The Authority's record in securing lump-sum competitive bids is outstanding. An average of 7 bids was received on each major contract bid during 1949.

6
Assembly-line techniques, repetition keeps costs down.

The Authority is often asked what particular features of design or construction have made possible the record it has achieved in the production of housing. In the early days, certain innovations were outstanding: Its pioneering in the use of controlled concrete; its demonstration that 6-story, elevator-type, fireproof buildings could be constructed at no more cost than non-fireproof structures, and at a lesser cost than walk-up type apartments; but even more important than these comparatively spectacular factors, is continued emphasis on the fact that the most minute feature of construction when repeated hundreds or thousands of times becomes just as import-



4 APTS. PER FLOOR

5 APTS. PER FLOOR

PLANS of typical housing units were compared by a short-cut method to determine relative costs. Numbers in parentheses give room areas in sq ft.

ant as a large single item.

The Authority encouraged development of concreting to permit a painted concrete slab to be used as the ceiling of an apartment. This has brought tremendous savings, both because of the type of finish and the reduction in the story height.

The Authority's projects were the first to use long-boom cranes for the placing of concrete instead of the customary hoist and runway method. The structures designed for the Authority are of such shape as to make feasible this type of operation.

Wall-bearing construction long ago was abandoned for skeleton-frame construction, since the latter type lends itself more readily to the storage and handling of materials for the finish of the buildings. This is especially important since the construction program is based on what is almost an assembly-line technique. It is common on one of these sites for families to be moving in at one end while buildings are still going up at the other.

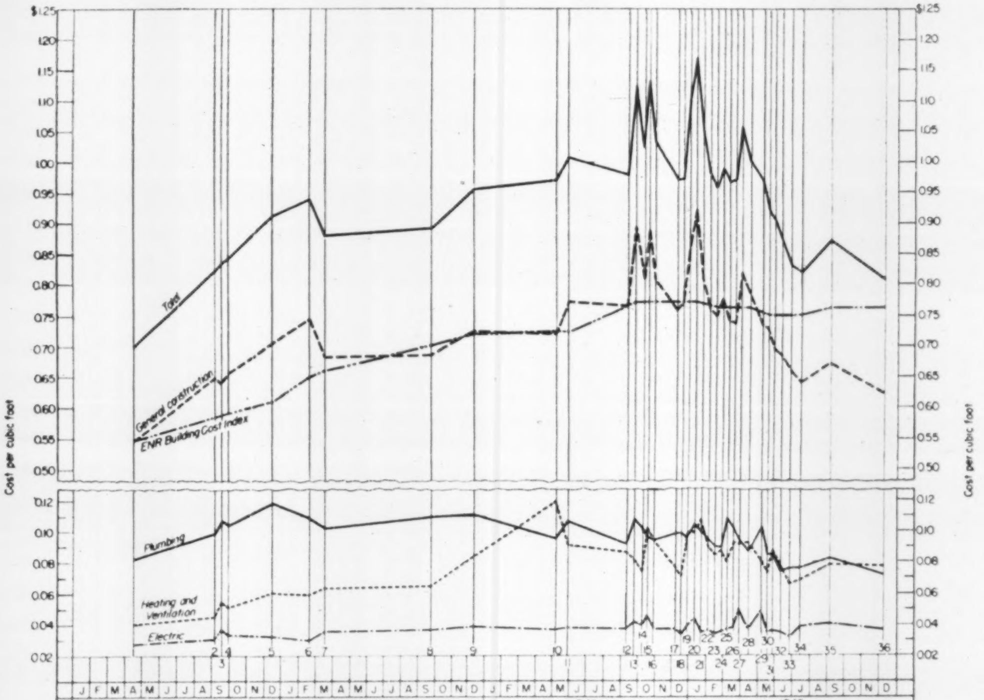
• Cost data—accumulated by the Authority since the end of World War II—indicate the effect of applying these principles. These data are unique in their scope, since they cover over $400 million worth of housing (sufficient to house 141,000 persons, or the entire population of Albany, N. Y., or Flint, Mich.) and represent a single type of operation—construction of fireproof housing with speed and economy.

The data for 1949 alone represent a distribution of bid dates that show the trend at practically any month in the year. In studying them, however, consideration should be given to the following factors:

1. While the program covered a single type of operation, some differences in standards of design exist for the various projects. Hence, reference should be made to both the statistical tabulation (Table II) and the cost curves in studying cost trends or comparing projects. For example, projects in the fully subsidized part of the program have somewhat smaller rooms and lesser amenities than those for veterans, which were constructed without cash subsidy. The basic features of construction, such as framing and quality of masonry, however, are the same.

2. One project, Governor Smith Houses, was constructed with a structural steel frame. Others all had reinforced concrete frames.

3. Projects in areas where labor was relatively scarce, or where length of transportation time affected both the cost of labor and materials, were more costly to construct. The Staten Island projects are examples of this situation.



1-Elliott Houses
2-Lincoln
3-Brownsville
4-Johnson
5-Amsterdam
6-Marcy
7-Jacob Riis
8-Lillian Wald
9-Gowanus
10-Astoria Sect. I Houses
11-Woodside
12-Eastchester
13-Smith Sec. I (Steel frame)
14-Albany
15-South Beach (Staten Island)
16-Sheepshead Bay
17-Bronx River
18-Patterson
19-Pelham Parkway Houses
20-Todt Hill (Staten Island)
21-Nostrand
22-Gun Hill
23-Dyckman
24-Glenwood
25-Sedgwick
26-Parkside
27-Chas. W. Berry (Staten Island)
28-Arverne Houses
29-Colonial Park
30-Boulevard
31-Lexington
32-Ravenswood Sect. I
33-Marble Hill
34-Farragut Sect. I
35-Melrose Sect. I
36-Ravenswood Sect. II

UNIT COSTS for projects of the New York City Housing Authority rose continuously after World War II until 1949, when the trend was reversed, as indicated by the curves. For comparison, the ENR building cost index is also shown.

TABLE I—COMPARATIVE COST ANALYSIS FOR SEVEN-STORY BUILDINGS

	Scheme No. 1 50 units having 4 apts. per floor, 1,400 total						Scheme No. 2 40 units, 5 apts. per floor, 1,400 total (one connection)		
Unit Type	A	A	B						
Number of Connections	1	2	1		Unit			Unit	
Times Used	20	10	20	Total	Costs	Cost	Total	Costs	Cost
Superstructure									
Gross floor and roof areas	529,280 sq ft	262,400 sq ft	563,360 sq ft	1,355,040 sq ft	1.78	$2,412,000	1,401,600 sq ft	1.78	$2,494,800
Exterior walls	317,862 sq ft	141,011 sq ft	326,400 sq ft	785,273 sq ft	2.435	1,912,100	936,960 sq ft	2.435	2,281,500
Roof area	66,160 sq ft	32,800 sq ft	70,420 sq ft	169,380 sq ft	0.50	84,700	175,200 sq ft	.50	87,600
Interior partitions	52,372 sq yd	26,994 sq yd	58,923 sq yd	138,289 sq yd	6.93	958,300	155,250 sq yd	6.93	1,075,900
Stair & Vent. Partitions	75,040 sq ft	37,520 sq ft	75,040 sq ft	187,600 sq ft	0.975	182,900	134,400 sq ft	.975	131,000
Public Hall Partitions	59,920 sq ft	29,960 sq ft	59,920 sq ft	149,800 sq ft	1.25	187,250	100,800 sq ft	1.25	126,000
Elevator Enclosures	28,000 sq ft	14,000 sq ft	28,000 sq ft	70,000 sq ft	0.865	60,550	56,000 sq ft	.865	48,500
Incinerator Flues 7x8 ft 7½ in.	1,200 sq ft	600	1,200	3,000 ft	25.40	76,200	2,400 sq ft	25.40	61,000
Scissors Stairs—Conc. Pairs	140	70	140	350	392	137,200	280	392	109,800
Elevators	20	10	20	50	10,000	500,000	40	10,000	400,000
Incinerators	20	10	20	50	345	17,250	40	345	13,800
Plumb. Stacks—Combined	560	280	560	1,400	150	210,000	1,120	150	168,000
Plumb Stacks—Separate	....	....	70	70	200	14,000	280	200	56,000
Bulkheads—Enclosing Walls	23,280 sq ft	11,640 sq ft	23,280 sq ft	58,100 sq ft	210	122,000	46,560 sq ft	210	97,800
						$6,874,450			$7,151,700
Substructure									
Excavation	661,600 cu yd	328,000 cu yd	704,200 cu yd	62,733 cu yd	3.00	$188,200	64,888 cu yd	3.00	$194,700
Footings and Walls	4,960 ft	2,200 ft	5,100 ft	12,260 ft	22.90	280,800	14,640 ft	22.90	335,300
Floor on Earth with Finish	66,160 sq ft	32,800 sq ft	70,420 sq ft	169,380 sq ft	0.50	84,700	175,200 sq ft	0.50	87,600
Elevator Enclosures 25 x 8	4,000 sq ft	2,000 sq ft	4,000 sq ft	10,000 sq ft	0.60	6,000	8,000 sq ft	0.60	4,800
Stair Enclosure 66 x 8	10,560 sq ft	5,280 sq ft	10,560 sq ft	26,300 sq ft	0.60	15,800	21,120 sq ft	0.60	12,700
Incinerator Walls 17 x 8	2,720 sq ft	1,360 sq ft	2,720 sq ft	6,800 sq ft	2.43	16,500	5,440 sq ft	2.43	13,200
Scissor Stair, Pair	20	10	20	50	392.00	19,600	40	392.00	15,700
						$611,600			$664,000
					Grand Total	$7,486,050			$7,815,700
Cubical Content									
Substructure	661,600 cu ft	328,000 cu ft	704,200 cu ft	1,693,800 cu ft	8,601 cu ft per apt.		1,752,000 cu ft	8,876 cu ft per apt.	
Superstructure 7x8 ft 7½ in.	3,994,000 cu ft	1,980,130 cu ft	4,251,240 cu ft	10,225,270 cu ft	$0.622 per cu ft		10,576,824 cu ft	0.629 per cu ft	
Bulkheads for El. Stair Incin.	49,000 cu ft	24,500 cu ft	49,000 cu ft	122,500 cu ft	$5,347 per apt.		98,000 cu ft	$5,580 per apt.	
				12,041,570 cu ft			12,426,824 cu ft		

Note: B unit is similar to A unit, shown in sketch, but somewhat larger and modified to fit the over-all distribution of apartments.

TABLE II—COSTS OF NEW YORK CITY HOUSING AUTHORITY PROJECTS—1949

PROJECT	Bid Date 1949	Constr. Rooms	Rental Rooms	Apts.	Cubic Ft	Fnd. & Superstr.	Heat'g & Vent.	Electric	Plumbing	Total Cost: Contract	Total Cost: Constr. Room	Total Cost: Rental Room	Total Cost: Per Apt.	Total Cost: Per C.F.	Piling or Abnormal Foundations
							1st Group—Standards For Low Rent Fully Subsidized Housing								
Farragut—I*	7/11	4,109	4,599	980	8,130,828	5,192,840	544,444	305,670	611,000	6,653,954	1,619.36	1,446.83	6,789.75	0.818	105,000
Farragut—I†							496,444			6,605,954	1,607.68	1,436.39	6,740.77	0.812	
Melrose—I*	9/21	2,191	2,455	528	4,152,076	2,790,220	317,700	167,673	340,000	3,615,593	1,650.20	1,472.75	6,847.71	0.871	25,000
Melrose—I†							254,823			3,552,716	1,621.50	1,447.13	6,728.61	0.856	
							2nd Group—Special Standards—Part 3—City Aided Program								
Todt Hill	1/6	1,890	2,174	504	4,454,900	4,106,345	441,737	193,329	462,735	5,204,146	2,753.52	2,393.81	10,325.69	1.168	77,800
Nostrand*	1/18	4,320	4,972	1,152	9,377,365	7,588,195	1,008,665	317,476	941,842	9,856,179	2,281.52	1,982.34	8,555.71	1.051	850,000
Gun Hill	2/1	2,768	3,127	738	6,221,645	4,729,279	562,600	217,330	592,222	6,101,431	2,204.27	1,950.90	8,267.52	0.981	124,500
Dyckman	2/9	4,410	5,050	1,176	9,780,114	7,312,610	812,800	328,500	879,435	9,333,345	2,116.40	1,848.19	7,936.52	0.954	673,600
Glenwood	2/23	4,620	5,214	1,188	10,242,805	7,954,026	894,650	350,170	910,000	10,108,846	2,188.06	1,938.79	8,509.12	0.987	600,000
Sedgwick	3/1	2,934	3,320	786	6,642,484	4,914,862	526,178	239,000	719,369	6,399,409	2,181.12	1,927.24	8,141.74	0.963	66,400
Parkside	3/22	3,273	3,682	879	7,454,500	5,483,574	683,700	274,600	762,600	7,204,474	2,201.19	1,956.41	8,196.22	0.967	250,000
Berry	3/29	1,871	2,123	505	4,520,277	3,697,320	411,420	221,000	425,400	4,755,140	2,541.49	2,239.29	9,416.12	1.052	53,000
Arverne	4/12	1,562	1,771	418	3,931,321	3,074,192	360,274	139,838	339,800	3,914,104	2,505.83	2,210.11	9,363.89	0.996	227,269
Colonial Park	5/11	4,031	4,472	984	7,911,809	5,811,144	636,600	376,000	804,444	7,628,188	1,892.38	1,705.58	7,752.22	0.964	660,000
Boulevard	5/17	5,351	6,071	1,441	12,141,094	8,811,606	873,583	409,400	1,006,480	11,101,069	2,074.58	1,828.39	7,703.73	0.914	67,834
Lexington	5/24	1,677	1,901	448	3,879,000	2,695,608	338,590	134,800	328,870	3,497,868	2,085.79	1,840.01	7,807.74	0.902	25,000
Ravenswood—I*	6/8	4,299	4,876	1,155	10,018,500	6,841,424	770,000	344,000	735,700	8,691,124	2,021.66	1,782.25	7,524.78	0.868	548,400
Ravenswood—I†							667,257			8,588,381	1,997.76	1,761.18	7,435.83	0.857	
Ravenswood—II†	12/6	3,758	4,263	1,011	8,088,600	5,043,090	616,243	291,270	577,700	6,528,303	1,737.17	1,531.21	6,457.27	0.807	450,000
Marble Hill	6/28	6,279	7,043	1,628	13,300,359	8,778,358	862,500	416,000	999,000	11,055,858	1,760.77	1,569.65	6,573.04	0.831	1,272,600

* Cost of complete boiler plant included in heating and ventilating and total cost.
† Proportionate part of cost of boiler plant included in heating and ventilating and total cost.
Note: Table does not include architects' fees, inspection, relocation of existing buildings, refrigerators, gas ranges or site improvement.

Notes on Modern Forming Techniques

A Note On Form Labor Costs

As every experienced contractor knows, nothing is more difficult to figure accurately than form costs. The actual data we publish is intended as a guide for costs obtainable with Atlas Speed Forms. You must still weigh the factors given. If a job is done in one district with $3 carpenter labor, it isn't necessarily true that with $1.50 carpenters in another district you will get half the square foot cost. The $3 men may be more efficient—or they may be less efficient.

What we want to bring out is simply this: Under the same conditions, Atlas Speed Forms will cost you less—considerably less—than any other type of form on the market, provided the work is suitable for a prefabricated form. You can safely figure on at least 25% reduction in labor costs with Atlas Speed Forms on a similar job.

Strip Sooner, Save . . . And Be Safe

Early stripping of forms offers so many advantages in job speed-up, lower costs of forms, better utilization of equipment, etc., that is worth a thorough study and appropriate action.

Safety of the concrete structure is, of course, the first consideration. The forms certainly should not be stripped until the proper concrete strength is attained, but what is the necessary strength? It is not usually that required by the structure under full live load. For stripping purposes, the design live load does not have to be taken into consideration. Only the dead load, plus any load that will immediately be placed on the structure.

Crane Handling Forms Cheapest

It depends on the job. On many jobs it is cheaper to use hand-handled forms rather than pay the cost of the crane, often leaving men with idle time. If you need the crane anyhow, and it will have idle time, then it is profitable to handle the forms in large units. Atlas Speed Forms can be handled either singly, or in panels of any size. On large jobs, a crane can be used full-time on forms alone.

How Many Uses?

After a long time, we were confused by the many conflicting reports from contractors stating the number of uses they were able to obtain from wood-faced forms.

A contractor recently stated he was getting 30 reuses from his original wood forms. This figure completely floored us as our own experience has showed us to expect not more than 4 to 8 reuses. Further investigation into this 30-use job revealed the startling fact that the contractor was spending between 30 to 35¢ per square foot to obtain a satisfactory surface finish after stripping.

Another contractor told us that he was obtaining only 3 uses from his wood-form surface but that he had reduced his finish cost to 6 or 7¢ per square foot. The answer as to who is the smarter contractor is obvious. The steel form surface can be depended upon to produce a uniform finish with several hundred uses. This inherent economy in a steel-faced form has not received sufficient consideration in the past.

Sub-Contract Your Concrete?

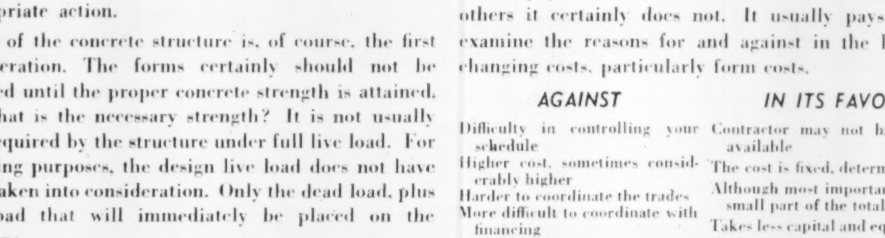
Does it pay? It does indeed under some conditions. On others it certainly does not. It usually pays to re-examine the reasons for and against in the light of changing costs, particularly form costs.

AGAINST	*IN ITS FAVOR*
Difficulty in controlling your schedule	Contractor may not have men available
Higher cost, sometimes considerably higher	The cost is fixed, determined
Harder to coordinate the trades	Although most important, it is a small part of the total
More difficult to coordinate with financing	Takes less capital and equipment
Loss of control on your own job	You don't have to keep a trained crew on your payroll
Danger of inferior work damaging your reputation	
Necessity of close supervision and checking	

You might remember that the forming cost is usually 60% of the cost of the concrete, and you may halve this cost with an adequate forming system.

Concrete Houses, $4450 Complete

You may have noticed the article in LIFE Magazine on concrete houses built by Ibec Housing Corporation



Irvington Form and Tank Corp.—Only

in Norfolk, Va., last August. Another article, more complete, appeared in ENGINEERING NEWS-RECORD in the issue of Nov. 16, 1949. Those houses were built by special forms designed exclusively for Ibec, as shown in the photographs. A double house was poured every day, with lightweight insulating concrete. The forms are lifted off in one piece. They are arranged for very quick stripping by hand, worked from a series of levers on the top. The units are 24' x 28', and have 5 rooms each.

A Cheap And Easy Way To Apply Hydron Lining

Atlas Magnetic Clamps allow the hydron lining to be placed on steel forms easily, quickly, economically. It is easy to place and adjust the clamps to secure a smooth lining with no rippling or wrinkling of the surface. They are withdrawn as the concrete is poured. The clamps can be rented or bought.

Why Atlas Steel Forms?

Not the least expensive, but the lowest over-all cost. A standard form, used vertically and horizontally, will match any other Atlas Form. They can be reversed, and do not have to be picked out individually. There are only two basic widths, 8" and 6", which, with the use of a filler strip, will make up any dimension. Designed for any type of tie, they withstand fast fours of 4' per hour. Only a minimum number of ties is required. There are no plywood panels which wear, require sanding, replacement, etc. Many customers have had over 100 uses and forms are still good for many more.

Rubbing Concrete

There is probably more harm done and more money wasted by rubbing than is generally appreciated. It often spoils the natural finish of the concrete, even to the extent of exposing the aggregate, and at considerable expense, facilitating erosion.

Proper finishing—adding—is a different story. It not only furnishes a smooth attractive surface, but with the right finish strengthening it, it is more resistant to weathering.

The best finish we know of is Speed Finish, a compound low in price, inexpensive in application, and with over 15 years of use in a number of large structures.

Comparing the relative merits of a rubbed finish to Speed Finish, we have the following facts: It provides a far better wearing surface against the elements, abrasion, and spalling than any rubbed finish. The so-called rubbed finish destroys the face of the concrete by disturbing the cement particles of the cement prior to the time the surface becomes case-hardened. The United States Corps of Engineers have discovered over a period of years that rubbed concrete faces do not withstand the elemnts and therefor, as a whole, prohibit the rubbing of concrete surfaces in structures so exposed.

Speed Finish develops both a chemical and mechanical bond with the original concrete surface, securely filling all honeycomb and bug holes; being a non-shrinking material, these fillers do not fall out in a year or so, preventing the exposing of these places to the elements and further deterioration.

Temperature And Steel Forms

Atlas Speed Forms are in use in Alaska and Okinawa, in Afghanistan and Chile, in every state of the Union. They are particularly efficient in cold weather, since heat can be applied readily and economically.

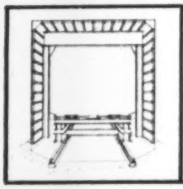
Square Edge Forms Available

We can furnish square edge forms that will take as fast a pour as our standard forms. They come in the same universal sizes that do not require the multitude of ties usually asociated with this type of form.

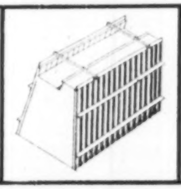
Have You A Concrete Forming Problem?

Ask our Mr. Anthony, without charge. Our Mr. Anthony is a lot of people, all specialists in their line, and with a lot of practical experience. The committee is composed of concrete technicians, professional engineers, experts on steel fabrication and concrete construction, and especially on form erection and costs. Also included are draftsmen who have specialized on concrete form design and layout for economically erection, etc.

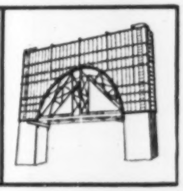
OR THIS CULVERT



OR THIS SEA WALL



OR THIS BRIDGE ARCH



Irvington Form & Tank Corp.
Irvington 10, New York

Gentlemen:
Please send me copies of your cost studies on forming jobs. No obligation, of course.

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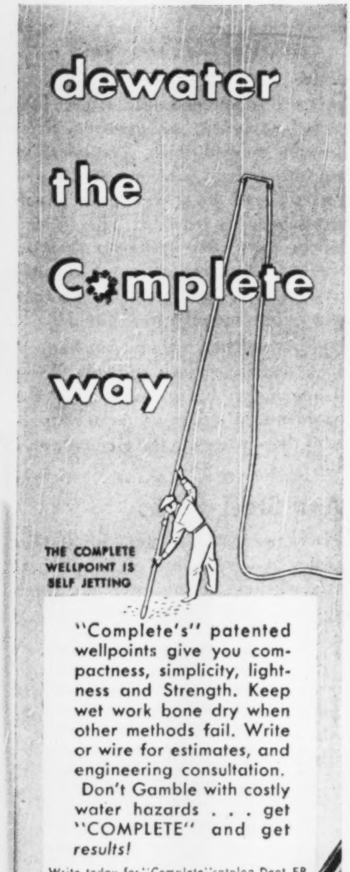
Manufacturers of Atlas Speed Forms



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MUNICIPAL AFFAIRS

Urge revamping Phila. construction supervision

Recommendations for organizing certain sections of the executive branch of Philadelphia's government—strengthen functions affecting construction—have been made by the Construction Council of the Chamber of Commerce.

The council in a new report, is urging the City Charter Commission on municipal operations to create a Department of Building Inspection. Its function would be:

To pass on all aspects of applications for construction, alteration, or demolition of buildings and other structures.

To inspect buildings and other structures as required by law.

To examine and issue licenses to occupations and operations that involve construction, maintenance, alteration, or demolition.

The recommendation also was made that a Department of Public Buildings be given responsibility for designing, constructing, and repairing all municipal buildings except where such buildings are specifically assigned to the Department of Public Works.

Also, it was urged that a Department of Public Works be designated to design, construct and repair, but not operate, bridges, highways, transit facilities, docks, wharves and related structures; water supply and distribution facilities; sewers and sewage treatment works.

In brief, what is proposed is one department to administer and enforce the provisions of the zoning ordinance, the building and plumbing codes, housing regulations, fire prevention, air pollution regulations, electrical installation, and ordinances and laws that require the collection of permit and license fees in connection with construction or property management.

At present there are four separate departments involved in the issuance of building permits.

San Diego would resume Sutherland Dam work

Completion of the Sutherland Dam on San Dieguito River at an estimated cost of $3,750,000 is sought by San Diego, Calif. The Bureau of Reclamation is studying a plan by which San Diego would repay for the construction of the dam over a period of 40 years.

The multiple arch concrete dam originally was financed by a $1,500,000 bond issue in 1927. Before a subsequent bond issue for completion could be voted, a new city administration unfavorable to the project entered office, and the work was abandoned. The existing structure, mainly concrete buttresses, is not adequate to store water.

The proposed dam would have a crest elevation of about 1,025 ft., and the height to crest of spillway gates above the streambed would be 158 ft. The reservoir storage capacity would be 36,724 acre ft. A concrete pipeline is proposed to divert water by gravity from Sutherland Reservoir into the San Vicente Creek drainage, where it can be picked up by existing facilities of San Diego.

The estimated $3,750,000 cost to complete the dam was based on 1947 prices. Construction would take about two years. If plans to make the dam a Bureau of Reclamation project fail, the city will attempt to float another bond issue to finance the work.

Municipal Briefs

Indianapolis, Ind.—The Board of Public Works has adopted official minimum specifications on construction of new streets in residential areas. They require that streets be made of 6 in. of gravel topped with 3 in. of sealed asphalt. Previously the asphalt was not required.

Big Airport Terminal—Construction on a new $4,500,000 terminal at San Francisco International Airport is scheduled to start in a few months. Architect William P. Day's plans for a column and slab structure call for a minimum number of bearing walls so that space may be freely converted from one use to another by shifting of partitions.

Bidders were shy—Construction of a $5,000,000, four-level underground garage below Pershing Square in downtown Los Angeles, Calif., has been delayed indefinitely because of lack of bidders on the project which was approved in a city election in 1947. Bidders were to build and operate the garage, leasing the land from the city and restoring the park surface when construction was completed.

Profitable city management—Under the city manager-engineer form of

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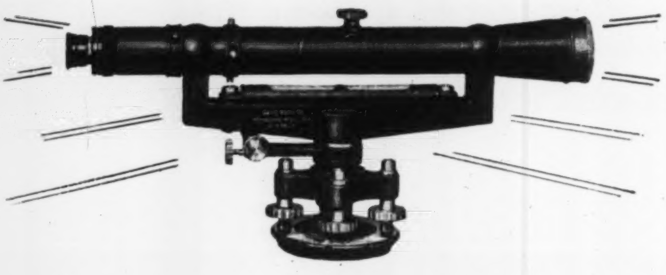

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David White 18" Dumpy levels give you more features for less money

Look at the chart of important engineering and construction features of the David White 18" Dumpy Level given below. Compare those features, item for item, with every other recognized make of instrument. Then compare prices. You'll see why we say David White 18" Dumpy Levels give you more quality, more advantages important to you in your work for less money. See your nearest David White dealer for complete details on this and other equally fine engineering instruments or write direct to David White Co., 315 W. Court St., Milwaukee 3, Wisconsin.

Features	D. White No. 7080	Instrument A	Instrument B
Magnifying Power of Telescope	35X	30X	27X
Distance away you can read 1/100 ft. graduation	1200 ft.	1050 ft.	900 ft.
Diameter of objective lens	1.81 in.	1.485 in.	1.69 in.
Field of view (In minutes of arc)	64'	52'	60'
Coated optics	YES	YES	YES
Covered Leveling Screws	YES	YES	YES
Can you easily replace worn leveling screws in the field?	YES	NO	YES
Sensitivity of level vial (in seconds of arc per 2mm of graduation)	20"	20"	25"
Price — Complete with carrying case, tripod and accessories — F.O.B. factory	$245.00	higher	higher

We offer complete, prompt repair service on all makes of instruments — levels, transits, theodolites, etc.

DAVID WHITE COMPANY

315 West Court Street
Milwaukee, Wisconsin

municipal control, the city of Lethbridge, Alta., reports that when a city manager was appointed in 1928, the city had a debenture debt of $2,000,000. By 1944 it had been reduced to $629,000, and since then the city has built up a reserve of $740,000 to finance various community projects.

Tremont St. widening—John deMeulenaer, Boston, Mass., city engineer, has been assigned by Mayor Hynes to work with the Traffic Commission in a survey to determine the cost of widening Tremont Street. The Mayor pointed out that if the widening project, which includes taking a portion of Boston Common sidewalk, is found to cost more than $100,000 the city will be unable to finance it this year. However, the state may be asked to finance it from the $100,000,000 highway fund.

Hartford blueprint — City Manager Carleton L. Sharpe of Hartford, Conn., is asking for a bond issue of $16,943,000 to finance 17 projects in five years for schools, institutions, library, police and court building. Other projects to follow include off street parking, swimming pools, fire stations, and street improvements.

Artificial lake—Bloomington, Ind., and the Indiana Department of Conservation are cooperating in a plan to solve that city's pressing water supply problem. Land is being bought for construction of an 1,800-acre lake northeast of the city to store more than five billion gallons of water. The city will own the land to be flooded and the state will hold uplands surrounding the reservoir for reforestation and recreation purposes.

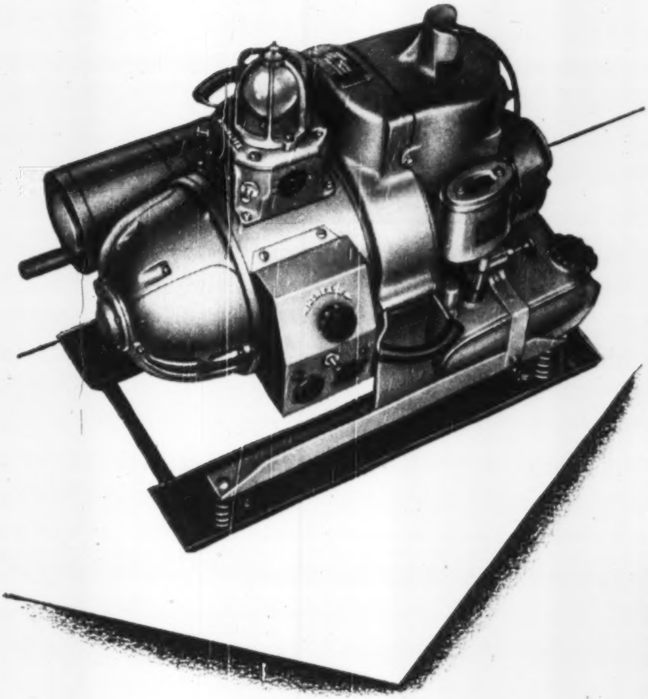
Parking meters pay—Last year, 400 parking meters produced $30,000 revenue for Saint Johns, N. B. So several hundred additional meters will be installed this year.

Public works department—Wakefield, Mass., has been authorized to establish a public works department to take over the highway, water and sewer departments formerly supervised by the selectmen.

Traffic-easing program—The railroad planning commission of Louisville, Ky., has outlined a $81,600,000 program to ease traffic problems there. It calls for central railroad terminal facilities at a probable cost of $16,000,000; the construction of 21 miles of expressways at a cost of $52,000,000; and elimination of 34 grade crossings at a cost of $13,600,000. A railroad terminal authority is proposed.

From Every Angle

A Homelite Carryable Generator Is the Power Unit for You . . .



STICK TO THE RULE OF THREE 1. Performance 2. Dependability 3. Service, and you'll always stick to a Homelite.

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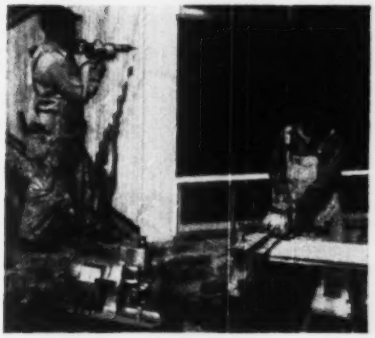
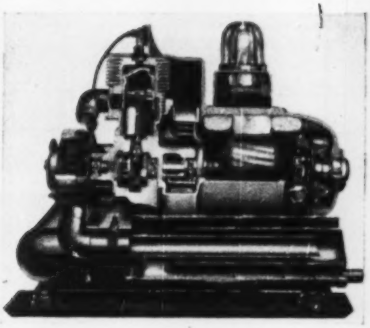


1. PERFORMANCE. Once you begin to use a Homelite . . . yes, even when you see it demonstrated . . . you immediately appreciate its outstanding performance. Light enough for one man to carry, a Homelite packs the power needed to keep hand tools running at full productive capacity . . . and floodlights burning at full brightness . . . at any time at any place in all kinds of weather.



2. DEPENDABILITY. Every Homelite Generator though light in weight is a *heavy duty unit.* No baby stuff about it. For more than a quarter century Homelite engineers have specialized in building carryable gasoline engine units . . . close to three hundred thousand of them . . . and they know that to keep a generator going on the job they have to use the finest materials and apply the highest engineering skill.

HOMELITE
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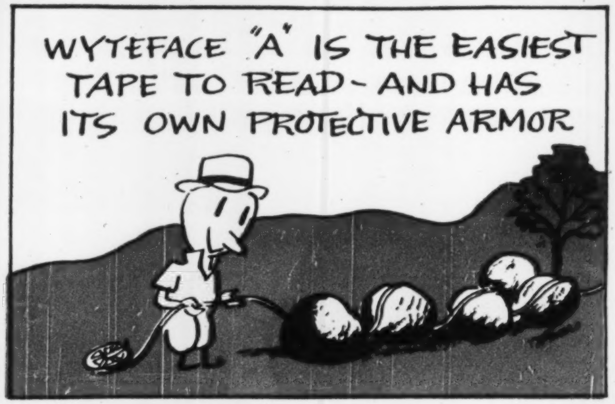
3. SERVICE. Like all pieces of machinery, a Homelite Generator needs, in the long run, a certain amount of servicing . . . a minimum to be sure. But the availability of Homelite service by nationwide exclusive service shops . . . completely stocked and manned by experts who can service your Homelite *right at your door* . . . makes a whale of a difference when it comes to having a generator that will give you instant power not only where you want it, but also when you want it.

K+E
K+E NEWS
-by don herold-


WYTEFACE "A" IS THE EASIEST TAPE TO READ - AND HAS ITS OWN PROTECTIVE ARMOR

the tape with the "inbuilt" permanent legibility

Here's the black-on-white steel tape that you might say is built with "hob nails". The name is WYTEFACE* "A".

It is made for a tough, rough-and-tumble, outdoor life. It is designed for dragging and for other forms of degradation which an engineer's tape must endure.

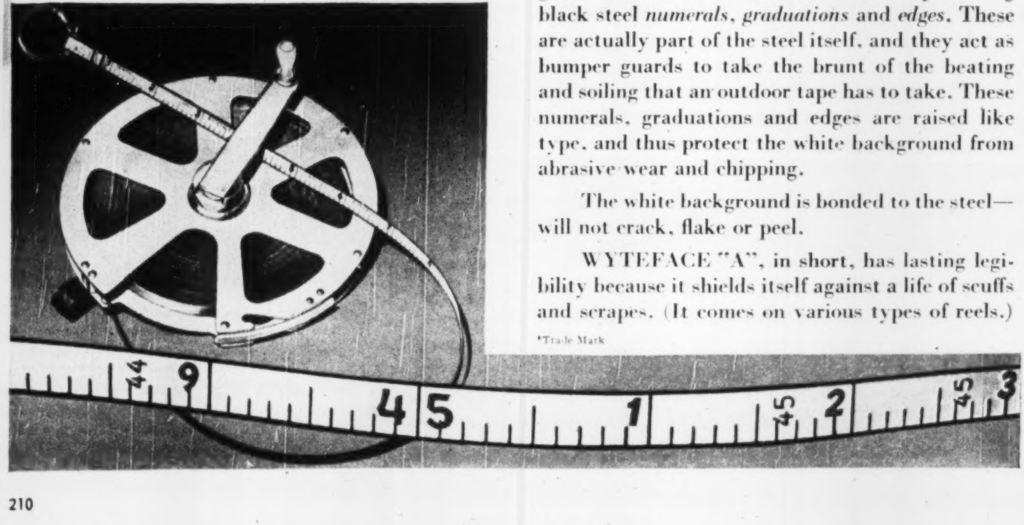
The explanation is:

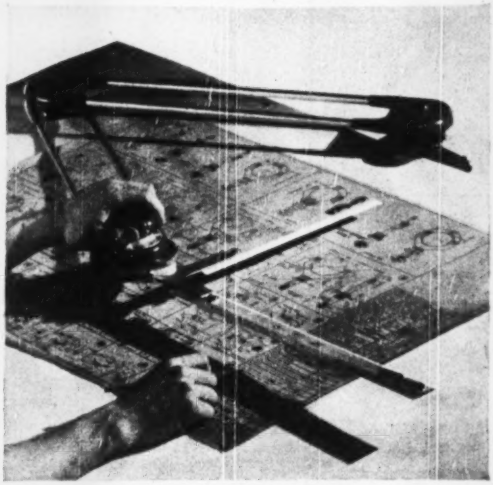
As a permanent and integral part of a basically strong steel tape which bears a lasting white background, Keuffel & Esser have formed upstanding black steel *numerals*, *graduations* and *edges*. These are actually part of the steel itself, and they act as bumper guards to take the brunt of the beating and soiling that an outdoor tape has to take. These numerals, graduations and edges are raised like type, and thus protect the white background from abrasive wear and chipping.

The white background is bonded to the steel—will not crack, flake or peel.

WYTEFACE "A", in short, has lasting legibility because it shields itself against a life of scuffs and scrapes. (It comes on various types of reels.)

*Trade Mark



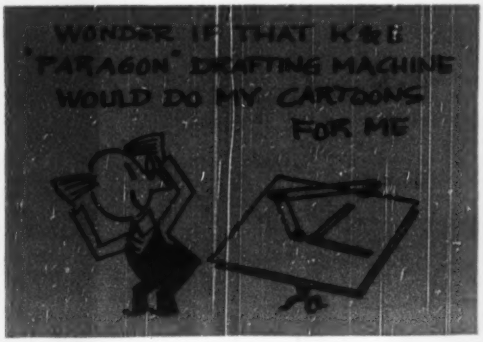


it's twice as fast as "human" drawing

You wouldn't try to be Rachmaninoff without a piano, or a Kreisler without a fiddle. Well, who would want to be a draftsman without a K&E PARAGON† DRAFTING MACHINE?

This miracle machine makes you a veritable orchestra leader at your drawing board. It combines T-squares, triangles, protractors and scales, all in one unit, controlled entirely by one hand.

You can move a rule all over the board, and the rule stays parallel to its original position. You can draw all lines to exact length. The lightest touch rotates the scales to any angle desired.


WONDER IF THAT K&E "PARAGON" DRAFTING MACHINE WOULD DO MY CARTOONS FOR ME

Permanent accuracy is assured, because the open center arm construction makes it practically impossible to disturb the factory-set band tension.

†Trade Mark ®

this whee-e-eraser saves time and elbow grease

AND I CAN REMEMBER WHEN I THOUGHT ERASING WAS DRUDGERY-LIKE DISHWASHING!

This K&E MOTORASER* makes old-fashioned hand erasing look horse and buggy. It reduces your erasing time to seconds.

Since it depends on speed rather than pressure, the MOTORASER does not wear holes in paper. It's as accurate as a pencil point, yet will clean large areas in a jiffy.

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The Permutit® Spiractor®—last word in Cold Lime Soda Treatment—softens water in EIGHT MINUTES!

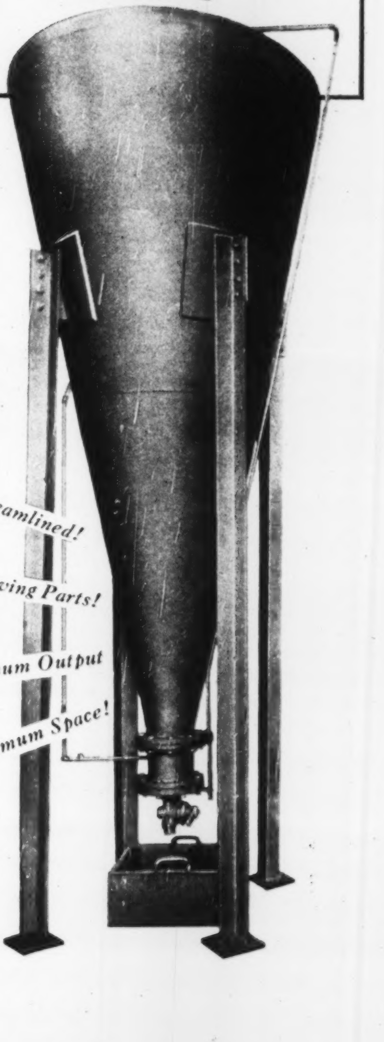
The Spiractor softens water up to 20 times faster than previous cold lime soda methods. That means you can cut your space requirements to a minimum!

Operation of the Spiractor is simple and sure: Hard water and the required lime enter at the base of the cone at a flow rate strong enough to suspend a catalyst bed of calcium carbonate granules without any carryover. The treated water is given a swirling, upward motion by being admitted tangentially to the cone.

The water softening reaction results in precipitates which are deposited on the catalyst granules by accretion. The enlarged granules are drawn off by a valve at the base.

The effluent is soft water that has a low alkalinity content and is suitable for any desired filtration.

Write for full information to The Permutit Company, Dept. ENR-3, 330 West 42nd Street, New York 18, N. Y., or to Permutit Company of Canada, Ltd., Montreal.



Permutit

WATER CONDITIONING HEADQUARTERS FOR OVER 36 YEARS

DEVELOPMENTS ABROAD

American producers profit from U. S. foreign aid

More than $21,000,000 worth of United States industrial machinery, tractors, construction and mining equipment, engines, generators, and other machinery and equipment are going to Western Europe under one recent week's Marshall Plan purchase approvals announced by the ECA.

The countries which received the authorizations were: Austria, Belgium, Luxembourg, Denmark, France, Germany, Greece, Ireland, Italy, The Netherlands, Norway, Sweden, Trieste, and the United Kingdom.

The cumulative Marshall Plan total for Europe at that time was more than eight billion dollars.

• **For Indonesia**—The Export-Import Bank is also doing much to aid foreign countries while simultaneously helping the export business of American producers. It has recently authorized the establishment of credits up to $100,000,000 for the Republic of the United States of Indonesia to assist in financing the import from the United States of capital goods urgently needed for reconstruction of the economy of that new and independent nation of 75,000,000 people. The credits will bear interest at 3½ percent and will be repayable over a period of 20 years, with principal payments beginning after five years.

• **Aid to Israel**—Another new nation being helped by the bank is Israel. Early in February, further credits totaling $20,000,000 were announced. The money is to be used for the purchase of United States equipment, materials and services necessary for the continuation in 1950 and 1951 of that country's construction program, which includes, in addition to the building of houses and community facilities, construction and reconstruction of inter-urban highways and the expansion of water supply and sewage disposal facilities.

Israel expects to house about 400,000 immigrants—including upwards of 75,000 now in camps—during the next two years. It has also programmed the construction of about 230 miles of urban streets and 150 miles of interurban roads during those two years. Sewage-disposal projects for Tel Aviv, Haifa, and Jerusalem, and water-supply systems for those three cities and 25 other municipalities are also to be undertaken.

The new credits extended are to be

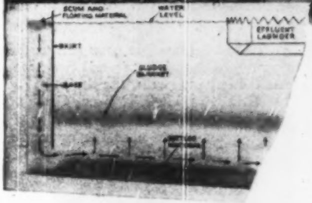
Establishing remarkable records for high purification at low cost—

YEOMANS "SPIRAFLO" CLARIFIER and "AERO-FILTER"

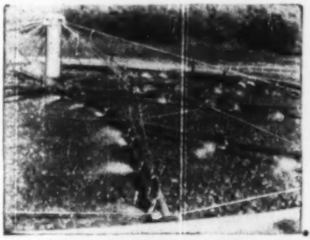
SINGLY . . . OR IN COMBINATION

. . . especially in the treatment of strong industrial wastes

Low construction cost . . . low operating cost . . . high purifying efficiency: these are the characteristics of the Yeomans "Spiraflo" Clarifier and the "Aero-Filter System," whether used separately or in combination.



"SPIRAFLO" CLARIFIER—Unusual functional design makes this unit a highly efficient clarifier for use in trickling filter plants . . . eliminating several non-essentials that multiply construction and operating costs. Upward flow of influent through sludge blanket increases removal of settlable and suspended solids.



"AERO-FILTER SYSTEM"—Simplified design of this high capacity biological trickling filter cuts construction costs—reduces size of required filter bed by about 85%. High efficiency of single stage operation eliminates need of installing and operating expensive conventional recirculating equipment.

FIT ANY REQUIREMENTS—Overall plant efficiency is always higher when the two units are used in combination; however, plants using either type of equipment or the combination can be designed to fit any needs for treating domestic and industrial wastes.

IMPORTANT INFORMATION—Facts as to remarkable records established by Yeomans units will be helpful in your project planning. Bulletins containing performance data, field engineering data and construction cost estimates are available on request—use the coupon.

YEOMANS

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1445 North Dayton Street
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Please send these bulletins:
☐ No. 6570—"Aero-Filter"
☐ No. 6790 "Spiraflo" Clarifier

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Company ____________
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City ____________ State ____________

6 REASONS WHY YOU CAN BANK ON THE

WARCO®

high productive factor

- Completely cab-controlled blade travel from 90° on one side to 90° on the other
- Retractable scarifier, blade revolves 360° without removing scarifier or teeth
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An almost impassable road in Lamar County, Alabama, becomes a two-lane rural highway with the help of a WARCO 100 H. P. Motor Grader. Stubborn Alabama red clay was quickly put in place as the operator bank-sloped, ditched and shaped in exceptionally fast working time.

High-angle bank cutting or routine grading . . . whatever assignment you give your WARCO Motor Grader, it continues to deliver an amazingly high productive factor. Why? Because its finger-tip hydraulic controls and speedily positioned blade help to turn out more work in fewer hours . . . and every foot it travels is a foot it works. That's why you can bank on the WARCO high productive factor.

See the WARCO . . . compare its construction, operation, performance . . . then you'll decide that your next motor grader must be a WARCO.

4D-100 WARCO Heavy Duty 100 H. P. Motor Grader
4D-76 WARCO General Duty 76 H. P. Motor Grader

W. A. RIDDELL CORPORATION

BUCYRUS, OHIO

amortized in 15 years and will bear interest at 3½ percent. They bring to a total of $93,350,000 credits authorized thus far by the Export-Import Bank under the $100,000,000 earmarked for Israel in January, 1949.

- **Australia, too**—As a result of a deal just concluded between the International Harvester Co. and the Australian government, contractors and public works authorities "down under" soon will be speeding up long-delayed jobs with $1,575,000 worth of IHC's crawler tractors.

International Harvester has been permitted to ship tractors without dollar license and to invest the proceeds of the sale in the expansion of its Australian branch plant.

An official at the Melbourne office told McGRAW-HILL WORLD NEWS that tangible asset backing will be provided for the extra capital by construction of new buildings for expansion of the Australian operations.

R. G. Casey, Minister for Supply and Development, expressed the hope that other American capital goods suppliers will take the cue and submit proposals along similar lines. He said that transactions such as the one with IHC, designed to overcome existing dollar difficulties, are warmly welcomed by the Commonwealth government.

Propose inter-American engineering organization

Proposals for an inter-American engineering organization made at the first Pan-American Engineering Congress held in Rio de Janeiro last July have been approved by the Committee on International Relations of the Engineers Joint Council.

This action assures the full participation of United States engineering societies with those of other American nations in an organizational meeting to be held in Havana at a date to be announced later.

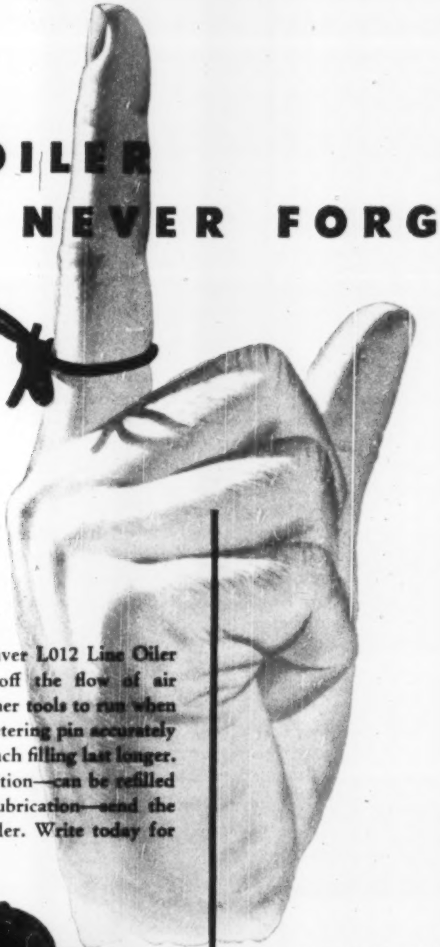
Objectives of the new organization would include the further advancement of engineering science and practice, and the development of engineering skills by direct exchanges among the participating societes.

Darling River project enters final phase

The final phase has started in taming and harnessing the 1700-mile-long Darling River, the second longest in Australia. Engineers expect it will take 10 years to bring Australia's "rogue river" under complete control.

In unregulated flow this stream has been totally unpredictable, winding its

THE OILER THAT NEVER FORGETS!



When a Gardner-Denver L012 Line Oiler runs out of oil—it automatically shuts off the flow of air through the line. No chance for drill or other tools to run when dry! You save oil, too, with the L012. A metering pin accurately regulates the flow of atomized oil—makes each filling last longer. The L012 operates equally well in any position—can be refilled without stopping the work. For positive lubrication—send the oil by air with a Gardner-Denver Line Oiler. Write today for complete information.

Gardner-Denver L012 Automatic Line Oiler—for any tool using 25 to 500 cubic feet of air per minute. Oil capacity—one pint.

OTHER GARDNER-DENVER LINE OILERS

Models L07, L08 and L09

GARDNER-DENVER

Models L011 and L014

Model	L07	L08	L09	L011	L0114
For Air Flow (Cu. Ft. per Min.)	75-450	35-200	10-75	75-450	75-450
For Use with	Large Drills	Small Drills	Air Tools	Wagon Drills	Mine Car Loaders

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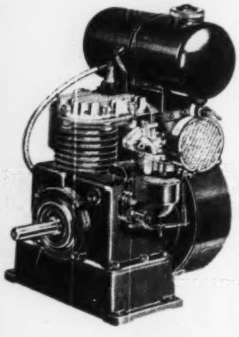
USE COMPRESSED AIR FOR SAFETY CONVENIENCE FLEXIBILITY



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ENGINES
Compact • Quick-Starting
Reliable

Model K7-1, *1½ H P 4-cycle, single cylinder, air-cooled. Length 13", width 14", height 17", Weight 38 lbs.*

POWER FOR:
- Concrete Mixers
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- And other uses.

Kohler Engines are designed, engineered and built to give the same dependable, economical service that has won world-wide acceptance for Kohler Electric Plants in construction and other industries. Made in several sizes, they are suited to a wide range of uses. Kohler engineers will gladly assist in working out applications for your particular requirements. Write for information. Dept. 21-V, Kohler Co., Kohler, Wisconsin. Established 1873.

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PLUMBING FIXTURES • HEATING EQUIPMENT • ELECTRIC PLANTS • AIR-COOLED ENGINES

NON-STOP PROFITS
PUT A *SANSTORM* ON THE JOB

Your sandblasting headaches end WHEN SANSTORM GOES ON YOUR CONSTRUCTION JOB! Fast and easy, your Sanstorm Sandblast Machine will clean every kind of steel fabrication, concrete, brick, stucco and equipment. You'll say it's the greatest money-saving piece of machinery on your job.

CHECK THESE FEATURES
- ✓ **JOB EFFICIENCY.** No wonder Sanstorm is the leader because no matter what abrasive you use, it won't plug.
- ✓ **JOB ECONOMY.** Simply designed, Sanstorm machines are built for rugged working conditions, yet always maintain a constant, precision flow.
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Dealers in all principal cities.
For further information write or wire:
Charles M. Spears,
SANSTORM MANUFACTURING CO.
Santa Clara and H Streets Fresno, California

way south through the western districts of New South Wales to empty into the Murray River. At some times it has caused raging floods; at others there is thirst and erosion in the whole region.

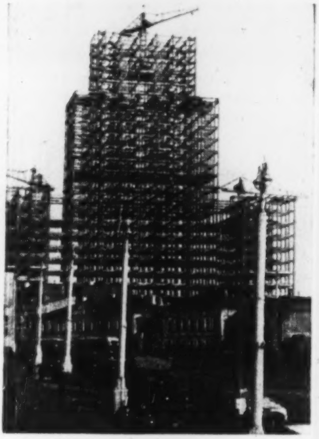
Construction work now starting will create brimming lakes in place of shallow pools. It will bring a new water supply to the great silverlead mining city of Broken Hill, population 27,000, now dependent on a failing supply from scanty rainfall. It will provide water for 100 new irrigation projects.

The main plan provides for the creation of water storage of 2,000,000 acre ft by diverting the flow of the Darling into lakes Tandure, Damamaroo, Menindee, and Cawndilla. These lakes, usually dried up, flank the sluggishly-flowing river about 300 miles upstream from its junction with the Murray on the Victorian border.

South African Railways

In the next decade, the South African Railways & Harbors Administration will spend many millions on a big capital program involving shops, new stations, ports and airfields.

Johannesburg station is already being extended and improved. Cape Town will get a new one on the foreshore development area, while the Hex River tunnel is well under way.



RUSS SKYSCRAPER—Evidence of Russia's push toward modernization of its capital city—and of increasing technological advances—is this 20-story, steel framed office building, now under construction on Smolenskaya Square, in Moscow. The structure will be faced with brick and hollow tile. The cranes shown—which look like the familiar hammerhead cranes of U. S. practice—are called "Velikhov" cranes by the Russians, and are said to have capacities of five to 15 tons. (Sovfoto)

CAN YOUR CONSTRUCTION MEET WEATHER EMERGENCIES?

Time and time again driving rains, cloud bursts, near-flood conditions, and fast-melting snow drench construction, forcing water into walls and foundations . . . causing water damage running into thousands of dollars!

Hundreds of buildings waterproofed with Medusa Waterproofed Gray Portland Cement* are meeting these emergencies and preventing untold financial loss. If this time-tested waterproofed cement protects construction during water emergencies, certainly it is advisable for the engineer to use it in all below-grade construction.

Concrete for footings, foundations, and below-grade floors is always subjected to ground water. Safeguard this concrete by using Medusa Waterproofed Gray Portland Cement. Then, if emergencies arise, the structure is protected. This water-repelling cement contains stearates which repel water at the surface of the mass.

Medusa Waterproofed Gray requires no special mixing . . . no extra labor. To help you build dry construction, Medusa has prepared two easy-to-read references . . . Mail coupon for complimentary copies.

You can build BETTER with

MEDUSA PRODUCTS

REG. U. S. PAT. OFF.

*If not available, use Medusa Waterproofing Paste or Powder with regular cement.

MEDUSA PORTLAND CEMENT COMPANY
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Gentlemen: Please send me copies of the free booklets, "How to Waterproof Concrete, Stucco, and Masonry" and "A Discussion on Integral Waterproofing."

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City .... *State* ....

Save TIME AND MONEY BY USING THE *Safety-Engineered*

M·S·A *VELOCITY-POWER* *Driver*

- SELF-CONTAINED
- PORTABLE
- EFFICIENT
- NO RECOIL
- FLASHLESS
- EASY TO USE
- WEIGHS ONLY 4½ POUNDS

This modern self-powered Tool gives you speed, safety and dependability in anchoring conduits, attaching ductwork, hanging pipe or conveyor brackets to steel or concrete! The M.S.A. Velocity-Power DRIVER is the only powder-actuated tool employing an integral stud and piston which remain fastened together until the stud is imbedded preventing ricochet, flash, recoil or disturbing noise.

- *Driver cannot operate unless safety arm is rotated* and held in position. Demonstrations? Gladly, on request.

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At Your Service: 54 BRANCH OFFICES IN THE UNITED STATES AND CANADA

Men and Jobs

George K. Leonard, who supervised construction of several TVA dams, has been appointed TVA chief construction engineer. He joined TVA in 1933 and for the last four years has been project manager of the Watauga and South Holston dams. **W. K. Seaman,** now in charge of generating installations at Chickamauga and Guntersville dams, will succeed Mr. Leonard, and **H. L. Broadfoot,** Kentucky Dam, will succeed Mr. Seaman.

F. R. Burnette has been appointed assistant vice president-engineering of U. S. Steel Corp. of Delaware. In this newly-created position, Mr. Burnette will have special duties in connection with the future construction programs of United States Steel. Prior to his new appointment, he had been assistant chief engineer of Carnegie-Illinois Steel Corp., a U. S. Steel subsidiary.

Pennsylvania Department of Health has announced the withdrawal of **Edgar A. Stoudt,** of Philadelphia, as senior assistant sanitary engineer.

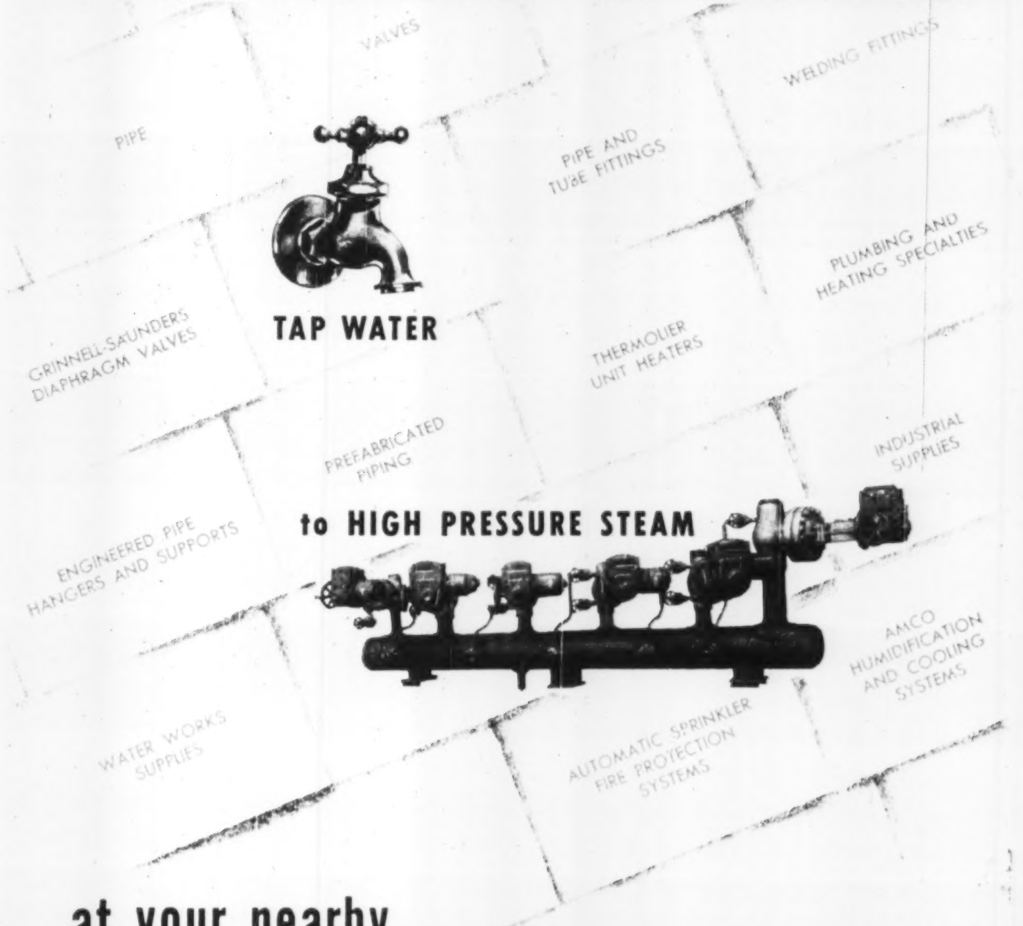
J. G. Drygen, assistant engineer at Atlantic regional base of the Canadian National Railways the last 31 years, has retired.

Harold D. Briley and **Harry F. Wild** have organized Briley, Wild & Associates, Inc., consulting engineers, at Daytona Beach, Fla.

E. C. Woodward, engineer manager of the Fort Worth expressway, will be principal engineer-consultant on a new study of the road needs of the Rio Grande Valley of Texas. **Frank E. Lovett,** supervising urban engineer at Fort Worth, will succeed Woodward as engineer-manager of the Fort Worth expressway. **M. C. Welborn,** district engineer at Dallas, will be senior engineer of special services with headquarters at Austin. **Frank W. Cawthon,** now senior resident engineer at Dallas, will replace Welborn as district engineer in that city.

Ray G. Sauerman, Dayton, Ohio, has resigned after serving eight years as Montgomery County road superintendent, to become road superintendent for Van Buren Township. **Otto F. Bieler,** Prymont, Montgomery, County bridge superintendent, will succeed Sauerman and combine duties of the two positions. **Howard Rohlfs**

EVERYTHING for PIPING



VALVES
WELDING FITTINGS
PIPE
PIPE AND TUBE FITTINGS
PLUMBING AND HEATING SPECIALTIES
GRINNELL-SAUNDERS DIAPHRAGM VALVES
TAP WATER
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ENGINEERED PIPE HANGERS AND SUPPORTS
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More than 1000 Grinnell warehouses and jobbers . . . one within easy reach of your phone . . . are ready to give you prompt delivery on any standard piping product. When the job calls for specialized piping products or installations, Grinnell has the manufacturing facilities, products, experience and engineering knowledge to "deliver the goods."

100th ANNIVERSARY WHENEVER PIPING IS INVOLVED

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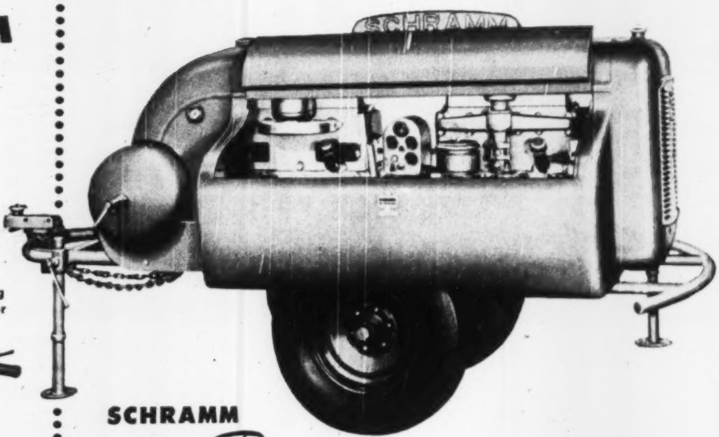
Grinnell Company, Inc., Providence 1, R. I. Warehouses: Atlanta • Buffalo • Charlotte • Chicago • Cleveland • Cranston • Fresno • Kansas City • Houston • Long Beach Los Angeles • Milwaukee • Minneapolis • New York • Oakland • Philadelphia • Pocatello • Sacramento • St. Louis • St. Paul • San Francisco • Seattle • Spokane

SCHRAMM is definitely your best buy in Air Compressors Because...



SCHRAMM HAS *Pneumastat*

Fuel Saver Up To 50%!

The SCHRAMM *Pneumastat* gives you the advantages of: Higher average working pressure—more work from your tools... Simple and rugged construction—no valves, no checks, no pistons. Longer compressor and engine life... Lower maintenance costs... Requires no service or adjustment.

SCHRAMM HAS UNIPOWER ENGINE

Greater lugging power • Expressly designed for compressor load, speed, torque, field conditions, easy starting, continuous 24 hour service, and remote operation without attendants.

SCHRAMM HAS SIMPLIFIED DESIGN

UNISTAGE eliminates two staging and intercoolers • Fewer parts—90% of engine parts interchangeable with the compressor.

SCHRAMM PROVIDES PLUS FEATURES

Tool boxes large enough for complete assortment of pneumatic construction tools • Easy winding, full capacity hose reels • Stronger air tanks—400# test • Watercooled—can be operated with doors in place • Dual fan belts • Heavy grill for radiator protection.

In addition, Schramm Inc. also offers their complete line of Golden Anniversary construction tools—a few of which are illustrated at the left. For full details write today for Bulletin SCT-50.

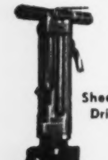
SCHRAMM INC.

The Compressor People • WEST CHESTER • PENNSYLVANIA

SCHRAMM TOOLS

Tie Tamper

Backfill Tamper

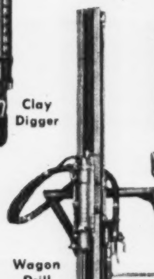


Sheeting Driver

Paving Breaker

Clay Digger

Trench Digger



Wagon Drill

Rock Drill

becomes assistant road superintendent for Montgomery County.

Fred Gloor has been appointed Clark County Engineer at Vancouver, Wash., to succeed **Stephen C. Jayne**, who resigned. Jayne had been engineer since 1947.

Malcolm Little, Jr., of Nashville, Tenn., has been appointed city planning director at High Point, N. C., a newly-created post. He is also administrative assistant to the city manager. He has been with a division of the Tennessee Planning Association at Nashville, and has had other planning posts at Kingsport, Johnson City, and Bristol, Tenn.

Harold P. Wood, a civil engineer, has been appointed to direct the Negro slum rehabilitation program in St. Petersburg, Fla., including the paving of streets and improvement of homes and yards.

John W. Johnson has been appointed general manager of the Buffalo, N. Y., Sewer Authority, succeeding **Frederick W. Crane**, now public works commissioner. Johnson has been superintendent of the sewage treatment plant on Bird Island.

Alfred O. Quinn has joined the photogrammetric engineering staff of Aero Service Corp., Philadelphia, Pa. Formerly he was associate professor of photogrammetry at Syracuse University, Syracuse, N. Y. Following graduation from Syracuse with the degree of B.S. in civil engineering, he was with the Maps and Surveys Division of the Tennessee Valley Authority.

L. J. Sverdrup and **W. W. Horner** of St. Louis and **H. M. Crothers**, dean of engineering at South Dakota State College, have been named to an engineering advisory committee to advise the Idaho operations office of the U. S. Atomic Energy Commission on planning and development of the reactor testing station at Arco, Ida.

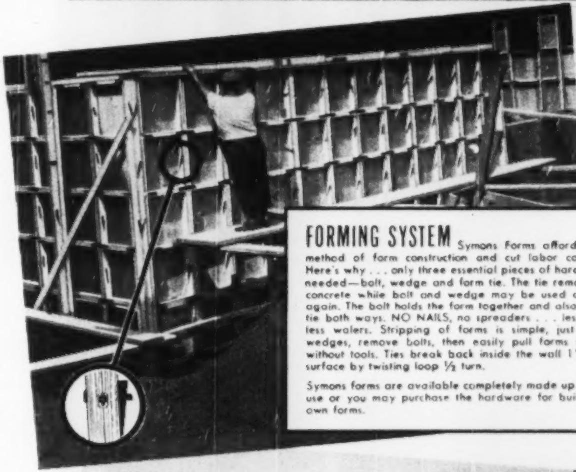
W. A. Blain has been appointed as resident engineer for the Lavon Dam and reservoir project near Dallas, Tex., succeeding **W. E. Williams** who continues as field engineer.

Clarence C. Davis has been appointed resident engineer at Detroit Dam on the North Santiam River, Ore. He succeeds **Lt. Col. John W. Miles**, transferred to Okinawa. Davis received his civil engineering degree from Texas A and M university and

SYMONS

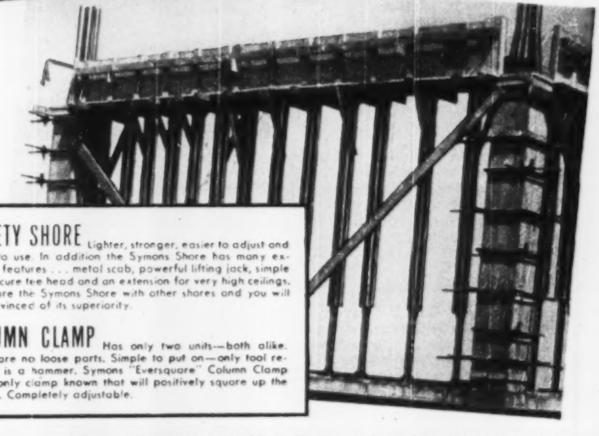
FORMS • SHORES
COLUMN CLAMPS

For Economy with Concrete



FORMING SYSTEM Symons Forms afford an easy method of form construction and cut labor costs 50%. Here's why . . . only three essential pieces of hardware are needed—bolt, wedge and form tie. The tie remains in the concrete while bolt and wedge may be used again and again. The bolt holds the form together and also holds the tie both ways. NO NAILS, no spreaders . . . less bracing, less walers. Stripping of forms is simple, just take out wedges, remove bolts, then easily pull forms up or out without tools. Ties break back inside the wall 1" from the surface by twisting loop ½ turn.

Symons forms are available completely made up ready for use or you may purchase the hardware for building your own forms.



SAFETY SHORE Lighter, stronger, easier to adjust and safer to use. In addition the Symons Shore has many exclusive features . . . metal scab, powerful lifting jack, simple and secure tee head and an extension for very high ceilings. Compare the Symons Shore with other shores and you will be convinced of its superiority.

COLUMN CLAMP Has only two units—both alike. There are no loose parts. Simple to put on—only tool required is a hammer. Symons "Eversquare" Column Clamp is the only clamp known that will positively square up the column. Completely adjustable.

Symons Forms, Safety Shores and Column Clamps can be rented with purchase option. Paid rentals apply on purchase price. Additional information will be sent on request —use coupon below.

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COLUMN CLAMPS
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☐ Catalog and Prices ☐ Construction details ☐ Samples
☐ Layout and estimate (our plans being sent under separate cover)

Information regarding other Symons Products
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DON'T BLAME YOUR PAINTING CONTRACTOR

You've often seen unsightly rust stains from metal sash on the adjacent brick and stone surfaces. You need never blame your painting contractor for unsightly stains caused by rust! You can *prevent* rust . . . and at no extra cost . . . simply by specifying RUST-OLEUM as the *shop coat, primer and finish coat* on all metal rust can attack.

But, specify RUST-OLEUM in the *first stages* . . . when design, engineering and contracting take form . . . before actual delivery of material for the job. RUST-OLEUM costs no more than quality material you may now be using . . . and is easy to apply at no added expense.

RUST-OLEUM is tested and proved by a host of nationally known users*. RUST-OLEUM *stops* and *prevents* rust! RUST-OLEUM protects metal from rust with a tough, pliable film that dries to a firm finish. RUST-OLEUM defies sun, rain, snow, salt air, smoke, fumes and other rust-producing conditions . . . and adds longer life wherever it is used. Girders, plates, stacks, gutters, roofs, tanks . . . every metal surface can be protected surely, safely and *economically* with RUST-OLEUM.

RUST-OLEUM *beautifies as it protects* because it is available in many attractive colors including aluminum and white. RUST-OLEUM can be applied to already rusted surfaces with minimum preparation . . . *it is not necessary to remove every appearance of rust!*

So, take the sure way to stop rust. Specify RUST-OLEUM on all rustable metal, inside or out. It costs less ALL WAYS to do the job right.

RUST-OLEUM is stocked and sold by leading industrial distributors in all principal cities of the United States and Canada. See Sweets for complete catalog and nearest source of supply, or write us direct for complete information.

*(*Names on request)*

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If you have a client with a rust problem, and would like a free survey and recommendations, send his name and address on your business stationery. A qualified Factory Representative will arrange this FREE Service, and it includes a trial size of Rust-Oleum for specific test purposes. These's no obligation on your part. Write today.

RUST-OLEUM CORPORATION

2533 Oakton Street, Evanston, Illinois

took his first job with the Corps of Engineers in the operations division of the Galveston District in June, 1927. He has been with the corps ever since, in a military or civilian capacity.

Woodley C. Warrick of Clayton, N. C., an engineering graduate of North Carolina State College, has been named rural housing specialist with the N. C. State College Extension Service. He will advise rural residents of the state on the planning and remodeling of their homes.

Dean Lorin G. Miller, of College of Engineering, Michigan State College, has been appointed engineering consultant by U. S. Radiator Corp. Dean Miller, recognized as one of the leading authorities in the United States in the field of heating, will actively participate in engineering research and development of the corporation.

F. J. Bateman of Fair Vale, N. B., has been appointed city engineer of Edmundson, N. B., succeeding **C. M. McPherson**, resigned. Mr. Bateman was formerly town engineer at Dalhousie, N. B.

H. H. Cox has been sworn in as Minister of Public Works, Province of Prince Edward Island, Canada.

Adolph J. Ackerman, director and vice-president in charge of hydroelectric construction of the Brazilian Technical Services and Management in Sao Paulo, Brazil, in addition, has been elected director and vice-president in charge of engineering of Canadian-Brazilian Services Limited, of Toronto, Ont. Both companies are subsidiaries of Brazilian Traction, Light and Power Co. of Toronto, which, through operating subsidiary companies, supplies electric power to the cities of Rio de Janeiro, Sao Paulo, Santos and the adjacent region in Brazil.

Geo. B. Finley, formerly of the Texas state highway department, has been appointed district engineer of The Asphalt Institute at Austin, Tex. He is a C.E. graduate of the University of Texas.

Lawrence G. Parker, General Services Administration structural engineer, after 40 years as a private and government engineer, will retire March 31.

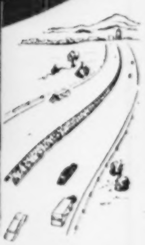
John B. Nabers will become the district engineer for the Texas Highway Department at Wichita Falls, Tex. With the department 31 years he will be

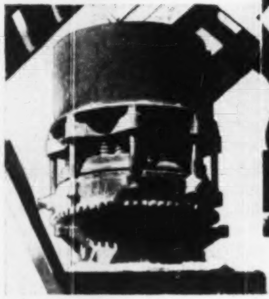
CRUSHING 500,000 TONS for Pennsylvania Turnpike

Eastern Extension

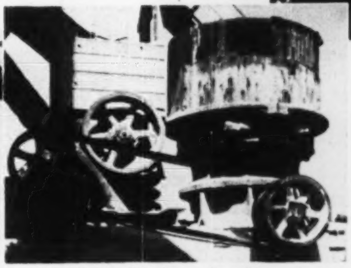
TELSMITH

Telsmith Scalping Screen



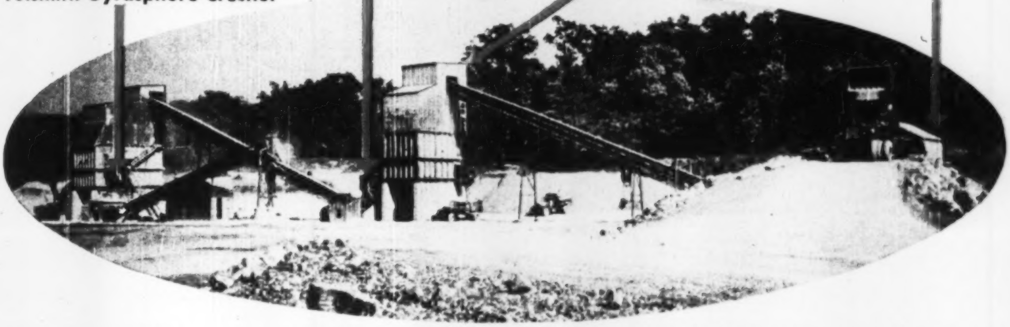


Telsmith Gyrasphere Crusher



Telsmith Jaw Crusher
Telsmith Gyratory Crusher

Telsmith Jaw Crusher
Telsmith Apron Feeder



Building the Pennsylvania Turnpike Eastern Extension brought an abnormally large demand for aggregate in Lebannon and Lancaster Counties. Pennsylvania Aggregates, Inc., built this completely new, Telsmith crushing plant at Cornwall to supply part of this temporary demand—about 500,000 tons in 15 months' time. Typically Telsmith, plant operation is smooth; up-keep is low; and production high—200-250 tons hourly, making a maximum of minus 2¼″ in four different sizes.

TELSMITH Equipment in This Plant

42″ x 14′ Heavy-Duty Apron Feeder • 30″ x 42″ Roller Bearing Jaw Crusher • 30″ x 150′ Primary Conveyor • 5′ x 12′ 2-Deck Heavy-Duty Scalping Screen • 10″ x 36″ Roller Bearing Jaw Crusher • 13B Gyratory Crusher • 30″ x 149′ Conveyor • 5′ x 12′ 3-Deck Vibro-King Sizing Screen • No. 36 Fine Crushing Gyrasphere Crusher • 24″ x 83″ Return Conveyor.

Get Bulletin 266—Telsmith Complete Plant Service.

Q-22

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Clyde Equipment Co., Portland 9, Ore., & Seattle 4, Wash. • Mines Eng. & Eqpt. Co., San Francisco 4, Calif. • Interstate Equipment Co., Statesville, N. C.
• Rish Eqpt. Co., Charleston 22, & Clarksburg, W. Va.—Roanoke 7, & Richmond 19, Va. • Wilson-Weesner-Wilkinson Co., Knoxville 8, & Nashville 6, Tenn.

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Compressors that last longer on the job!

Le Roi makes both engines and compressors — has the "know-how" to build in long-life and stamina that keep costs down!

- Airmaster Compressors from 60 to 600 cfm.

2 LE ROI CLEVELAND

Rock Drills that do more on the job!

Le Roi-Cleveland rock drills are less tiring. Their high drilling speed, strong rotation, hole-cleaning power and hard-hitting efficiency make it easier to get more done.

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transferred from the Childress district. **J. M. Isbell**, the Wichita Falls district engineer, will go on modified service, working on a traffic plan for the Wichita Falls area.

E. Gray Donald, formerly chief engineer, Quebec Power Co., has been named vice-president and chief engineer of Shawnigan Water and Power Co., Ltd., Montreal, Que.

Maurice du Pont Lee, general advisor to the chief engineer of E. I. du Pont de Nemours and Co., Wilmington, Del., has retired after a career of nearly 42 years with the company. He was engaged in engineering and development work for the company beginning in 1908.

L. B. Denton, assistant to the chief engineer of the Pacific Electric Railway, has retired after 45 years of service. Beginning with the company as a draftsman in 1913, he was appointed to his assistantship in 1922.

James E. Jones, for 41 years hydrologic engineer for the Los Angeles Department of Water and Power, retired Feb. 1. He was graduated from Polytechnic College, Oakland, Calif., as a civil engineer, and went with the water and power department in 1908 for what was thought to be a 10-day job. He stayed on to become its first hydrologic engineer.

Charles Elcock has become an associate in the consulting engineering firm of Birkinbine Engineering Offices, Commercial Trust Bldg., Philadelphia, Pa. Mr. Elcock was formerly senior engineer with the RFC and has long been identified with bridge, highway, and municipal engineering work.

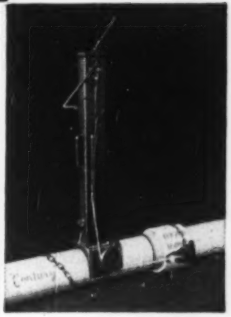
Clifford W. Pitt, senior engineer in the Bureau of Buildings, Rochester, N. Y., has been promoted to principal engineer. He succeeds **Frank R. Davis**, named superintendent of buildings, the post vacated by the resignation of **Walker F. Lee**, now a member of the New York State Building Committee. Mr. Pitt is a graduate of Rensselaer Polytechnic Institute. He entered the Buildings Bureau in 1929 and was named senior engineer in 1946.

E. J. Beatty, Sheboygan, Wis., is now engineer-manager of the Urbana-Champaign Sanitary District, Champaign, Ill. He has been with the Milwaukee division of the Wisconsin State Highway Commission.

Note the radius, with strictly standard pipe and couplings.

STRAIGHT LENGTHS MAKE A RADIUS

Easy does it with K&M *"Century"* ASBESTOS-CEMENT PIPE



Note the sure, simple, fast way to make tight joints for straight lines or radius.

5-DEGREE deflection at each pipe joint is perfectly safe and simple in laying K&M "Century" Asbestos-Cement Pipe with "Century" Simplex Couplings (made of identical material). Offsets may go to 13 inches per standard 13-foot pipe length. With shorter straight lengths even the sharpest practical radius is easy. Nothing special is needed.

Such simplicity underscores the economy of laying this K&M pipe—inexpensive to haul—light to handle—easy to cut on the site. Continued economy comes from high resistance to soil corrosion and immunity from tuberculation and electrolysis. The initial high flow capacity cannot be reduced by tuberculating waters.

Highly resistant to the stresses of traffic and earth settlement, as well as to chemical deterioration, K&M "Century" Pipe actually gains strength as it ages. It is recoverable for re-laying in its original pressure class! Here is low cost—lastingly. Write us for full data.

Nature made Asbestos...

Keasbey & Mattison has made it serve mankind since 1873

K&M
best in asbestos

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COMPANY • AMBLER • PENNSYLVANIA

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FOR HIGHWAYS AIRPORTS STREETS

You can count on Kinney Bituminous Distributors on every kind of job, large or small, new construction or old. They work fast and accurately — apply all grades of bitumen: oils, tars, asphalts, or emulsions. If desired the Fraco Circulating Hot Spray Bar can be furnished. Kinney Distributors have many exclusive features. Write for Bulletin A-49.

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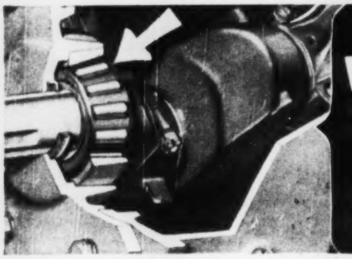
We also Manufacture Liquid Pumps and Vacuum Pumps



Why WISCONSIN HEAVY-DUTY *Air-Cooled* ENGINES

Run on Timken Tapered Roller Bearings

Single cyl.
3 to 9 hp.

2-cylinder
7 to13 hp.

V type 4-cyl.
15-to 30 hp.

Ever since the first Wisconsin Air-Cooled Engine was built over 20 years ago, the crankshaft of every one of these fine engines has been supported by Tapered Roller Bearings at BOTH ENDS. Here's why:

1. Tapered Roller Bearings take up all *End Thrusts* and *Radial Loads* (impossible with other types of bearings). You can mount your drive directly on the extended crankshaft of any Wisconsin Engine without the need for an extra thrust bearing or outboard bearing.

2. Tapered Roller Bearings resist wear to a greater extent than other types of bearings not only because of the file-hard surfaces of Timken Tapered Bearings but also because these bearings are inherently SELF-CLEANING. Oil enters at the smaller end of tapered roller bearings and centrifugal force carries it out through the large end, thus preventing accumulations of dirt and sludge that is often present in the oil. (Tapered bearings cannot develop shaft-cutting abrasive surfaces.

3. Tapered Roller Bearings permit flexing of the crankshaft to a much greater degree than the longer, rigid plain bearings which cannot stand up under flexing conditions, resulting in wearing "bell-mouthed" or failing completely. We have yet to hear of a single case of Wisconsin Engine bearing failure.

The use of **Tapered Roller Bearings** in **ALL** Wisconsin Engines from the smallest to the largest . . . 3 to 30 hp., single cylinder, 2-cylinder and 4-cylinder . . . is typical of the engineering diligence devoted to providing the user with "Most H.P. Hours of on-the-job service"

MOST H.P. HOURS

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 14, WISCONSIN

ELECTIONS AND ACTIVITIES

The Wisconsin Section of the Associated General Contractors of America elected the following officers: R. W. Kivell of C. R. Meyer & Sons Co., Oshkosh, president; D. E. Thomsen of Thomsen-Abbot Const. Co., Marshfield, vice-president; J. Harry Green, Jonesville, secy-treas.

Toledo, Ohio Section, American Society of Civil Engineers, has elected C. E. Pettis, consulting engineer with Finkbeiner, Pettis & Strout, president; Clair A. Shaler, of the same firm, and Joseph C. Webber, Toledo city engineering division, vice presidents, and Charles H. Kurtz, Jr., secretary-treasurer.

Akron, Ohio, chapter, American Society of Civil Engineers, has elected F. W. Stafford, Akron, president, succeeding M. P. Laurer; S. Y. Simms, Hudson, vice-president; and George S. Long, Akron, secretary-treasurer.

New officers of the Columbus, Ohio, Building Trades Employes Assn. are: Wayne M. Dornbirer, president; Ray Riethmiller, first vice-president; George S. Sheaf, second vice-president; William T. Halligan, secretary-treasurer; and Harry P. Nester, executive secretary. Trustees are Clarence J. Trapp, George P. Dysart, and F. M. Peart.

A. F. Faul of Des Moines was named president-elect of the Iowa Engineering Society at the business meeting of the society's sixty-first annual convention in Des Moines recently. Faul, who is retiring secretary-treasurer, will take office at next year's meeting. E. F. Behrens, Des Moines, who was made president-elect last year, will head the society during 1950. Other officers named are: H. M. Black, Ames, vice-president; and Ralph Fuller, Des Moines, secretary-treasurer. C. Maxwell Stanley of Muscatine, retiring president, was named to the board of directors.

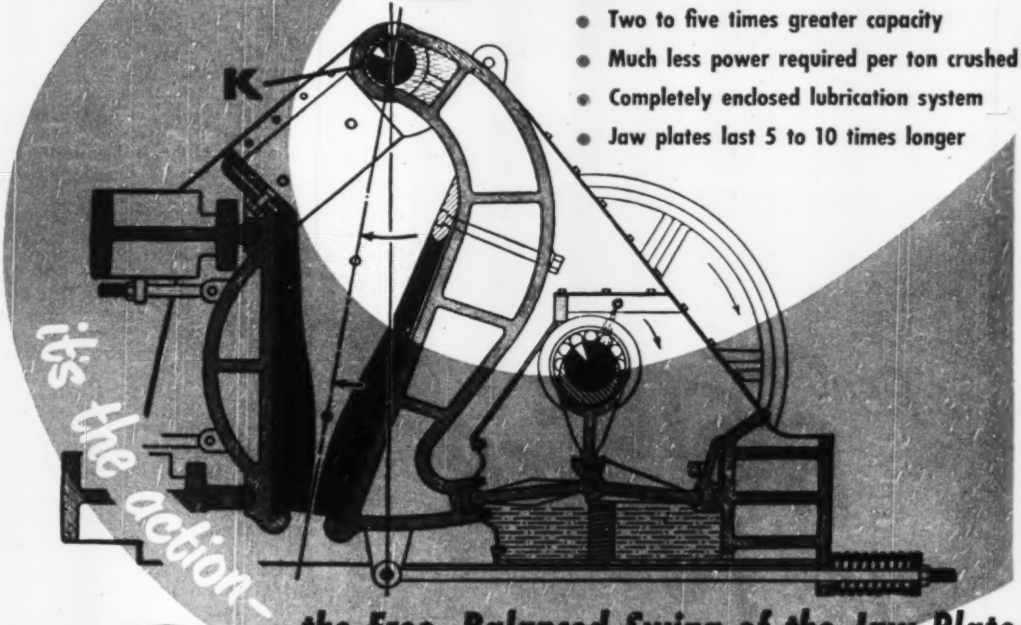
John A. Corenbaum, equipment engineer for the Pacific Telephone and Telegraph Co. at Portland, has been installed as president of the Professional Engineers of Oregon, succeeding Jack Hood of General Electric Co. Hilbert Johnson of Portland General Electric is new vice-president

NO OTHER *JAW CRUSHER* CAN TOUCH IT!

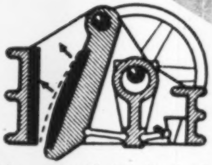
Look what you get

only in the KUE-KEN

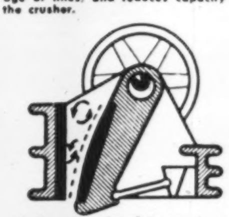
- Two to five times greater capacity
- Much less power required per ton crushed
- Completely enclosed lubrication system
- Jaw plates last 5 to 10 times longer



the Free, Balanced Swing of the Jaw Plate that "Crushes Without Rubbing"



Blake or Double Toggle Crusher
(Designed 1858)
Note how swing jaw forces rock upward causing rock to rub against jaws (see arrows). This rubbing action rapidly wears jaw faces, increases the percentage of fines, and reduces capacity of the crusher.



Dalton Overhead Eccentric or Single Toggle Crusher
(Designed 1879)
Moving jaw forces rock both up and down (see arrows), causing a rubbing action that not only results in excessive fines, but causes heavy jaw plate wear and wasted power. Bearing pressures on this type are very high.

Here's real efficiency and economy—in (of all things) a *Jaw* Crusher! The massive swing jaw with plate attached swings freely on the large hinge pin "K" as a balanced pendulum. No great weight is lifted on the swing upward as in usual jaw crusher design. This results in substantial power saving and an action that crushes without rubbing, giving less fines and little wear on the jaw plates. Kue-Ken's swing jaw moves squarely against the rock, instantly gripping and crushing without forcing rock upward. Don't turn down a jaw for the job or select any other jaw crusher until you've investigated the Kue-Ken, the improved jaw crusher. Send for Bulletin 5012.

Exclusive eastern manufacturer and distributor, PENNSYLVANIA CRUSHER COMPANY, *Division of Bath Iron Works Corporation*, 1715 Liberty Trust Bldg., Philadelphia 7, Pa. Exclusive western manufacturer and distributor, STRAUB MFG. CO., 507 Chestnut St., Oakland 7, Calif.

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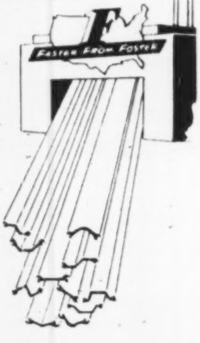

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and R. B. Temple, E. J. Himes and W. C. Williams, trustees.

Charles C. Zimmerman has been re-elected president of the Allied Construction Industries of Delaware, also James Cullen, vice-president; Arthur A. Carota, treasurer, and Francis E. C. McCann, executive vice-president and secretary.

D. W. Kelley has been elected president of the Arizona chapter, Associated General Contractors of America. Other officers, L. G. Vinson, vice-president; R. M. Makemson, secretary and director; James B. Donaldson; E. O. Earl, Tucson, and Orr, directors.

At the winter meeting of the New York State Society of Professional Engineers in Rochester, N. Y., the society recommended to the national society that it oppose "a policy in the military services of granting recognition to professional engineers at some level lower than that granted to the brother professions of medicine and law."

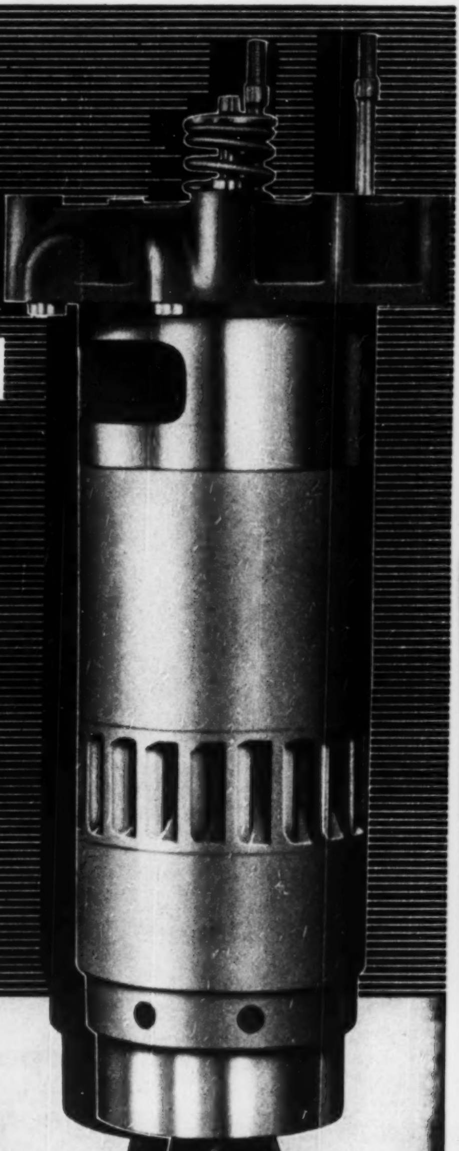
M. Frank Wooten, Charlotte, was elected president of the Society of Professional Engineers of North Carolina; Henry T. Gurley of Burlington and W. F. Evans of Wilmington, were named vice-presidents for the Western and Eastern Districts, respectively; John R. Gove of Chapel Hill, was named secretary; and T. C. Brown of Raleigh secretary. Board of governors: Robert B. Price of Raleigh and Robert W. Luther of Elizabeth City, for the Eastern District; and William F. Freeman of High Point and William D. Sheay of Greensboro, for the Western District.

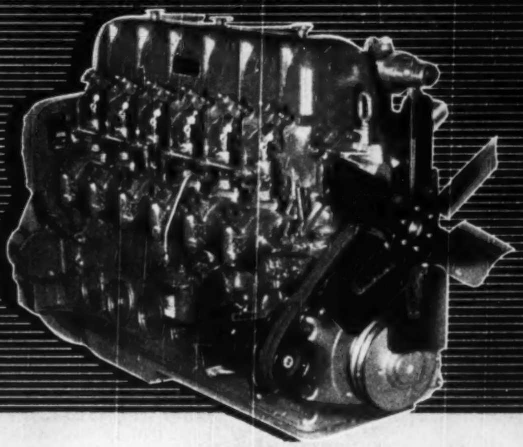
New governors of the Constructors' Association of Western Pennsylvania are: Heavy Division, W. E. Crawford, D. Dinardo, S. L. Muller, C. J. Jacobsen, C. B. Janson, J. E. O'Leary, and N. T. Wellings. Highway division, O. H. Benintind, M. C. Harrison, W. F. McCrady, W. R. McQuade, James Nardulli, R. F. O'Mara, F. O. Patterson, and R. C. Swank.

George M. Diebold was reelected president of the Engineers Club of Buffalo, N. Y. Other officers reelected were Herbert J. Thielke, vice-president, and James J. Lyons, secretary-treasurer. Other board members include Frank Savage, Thomas Brown, Alon Carter, Thomas McKee, Walter Jones, George Meyers and Arthur J. McNamara.

The Municipal Engineers of the City of New York have elected: President,

simplified design





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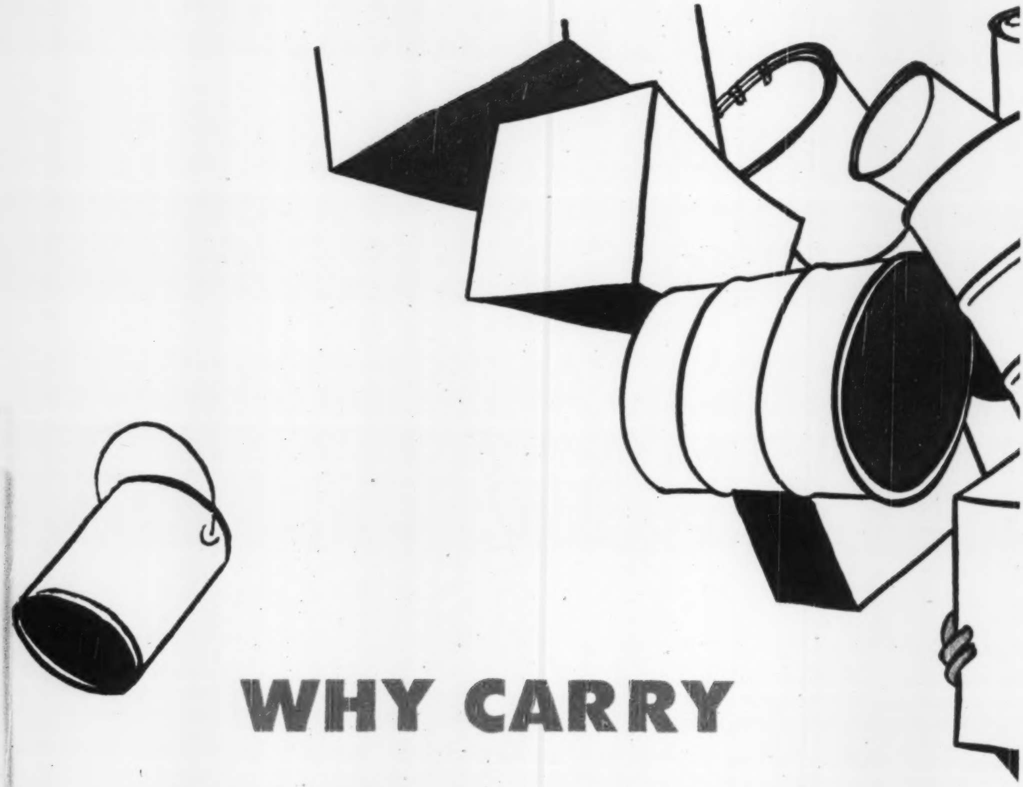

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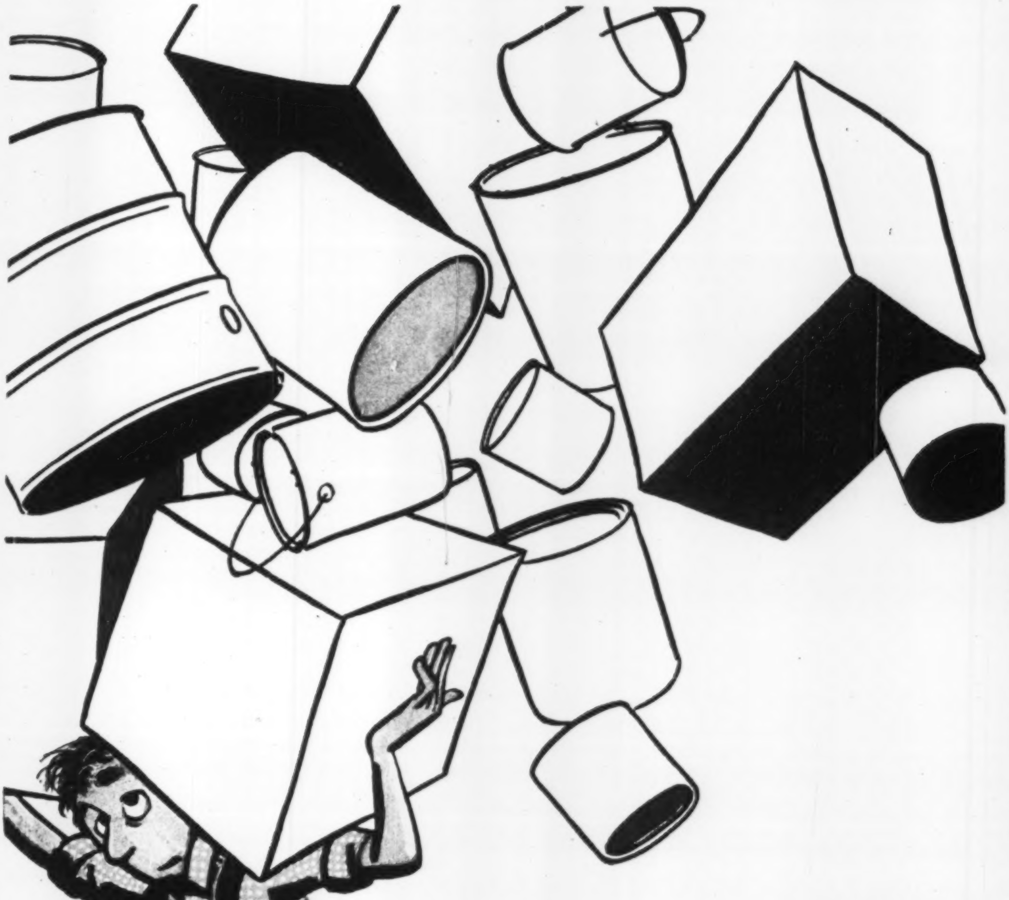

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STEELOX construction is so simple it is unique. Individual wall and roof panels provide both structural framework and finished surface. Assembling them into a sturdy, weathertight, fire-resistant structure is easy and economical with just a small unskilled crew. What's more, should conditions change, your STEELOX Building can be rearranged or quickly dismantled, moved and re-erected without loss of material.

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ARMCO STEELOX BUILDINGS

ARMCO

Chas. E. Fogerty; first vice-president, Albert H. Morgan; second vice-president, Wm. Spivak; treasurer, Stewart I. Sherman; and secretary, Walter G. Doherty; Directors, N. D. Brodkin, Joseph C. Collyer, Joseph M. Lonergan, and Chas. A. Riedel.

Robert Drummond of Toronto, Ont., has been elected president of the Canadian Construction Association of 800 members, succeeding Alan C. Ross of Ottawa. Percy Wilmot of Montreal, Que., is vice-president.

New officers of the Professional Engineers of New Brunswick are: John P. Mooney, president; J. H. Moore, vice-president; K. W. Salmon, secretary.

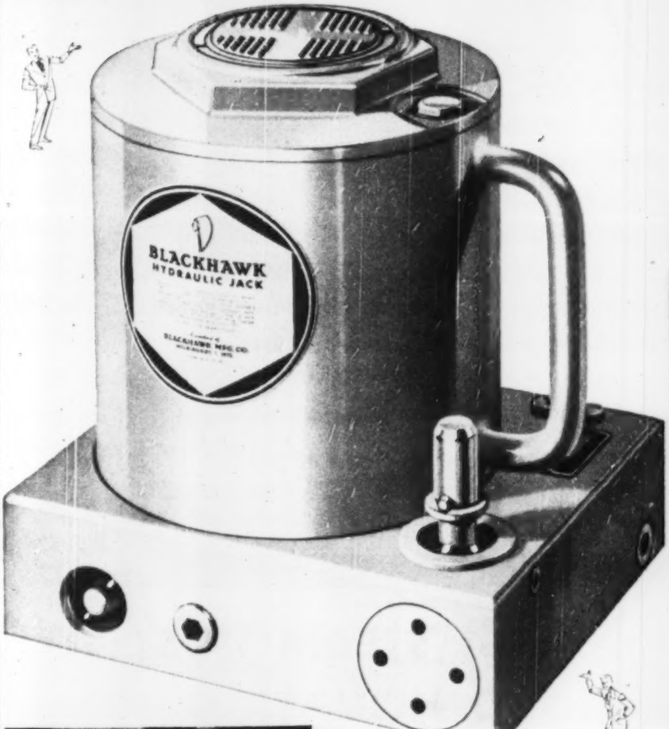
H. G. Haynes, of Charleston, has been elected president of the South Carolina Society of Engineers, succeeding J. A. McPherson of Greenville. S. N. Pearman of Columbia was re-elected secretary-treasurer.

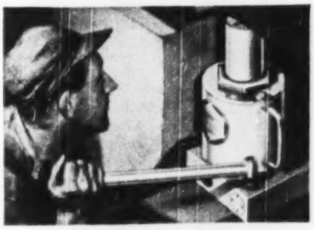
A. S. Janssen, dean of the college of engineering at the University of Idaho, has been elected president of the Idaho Society of Engineers, H. R. Flint of Pocatello is the new vice-president, with James L. Morris of Boise as secretary and Archie Biladeau, Boise, treasurer. Orland C. Mayer, retiring president, was elected a director of the national association.

C. V. Wilder of Bellingham, Wash., is the new president of the Mountain Pacific chapter, A. G. C., serving with Tom Youell of Seattle, vice-president, and Don Cooney, Seattle, treasurer. Trustees are George Gauntlett, Aberdeen; A. W. Stevens, Mount Vernon; Paul Ellis, Kennewick; Kenneth Riggle, Yakima; Phil Butler, Joe Fiorito, Elmer White, Al Cohn, Roy Snow, Alex McEachern, Henry Nollan, Hugh Anderson and C. R. Wilcox, Seattle.

Robt. L. Fitzgerald has been elected president of the Duluth, Minn., Engineers Club. Other officers, H. A. Barber, first vice-president; John Burlie, second vice-president; J. C. Haroldson, secretary; and Robt. N. Bateman, treasurer.

Donald E. Reed, partner of Stanton Reed Co., Los Angeles general contractors, has been elected president of the Southern California chapter of the Associated General Contractors of America. Vice-presidents include R. V. Edwards, American Pipe and Construction Co.; B. M. Laulhere, Jr., Macco Corp., Pipeline Division; and Claude A. Fisher, Claude Fisher Co., Ltd. Spencer Webb of Spencer Webb Co., was elected treasurer.





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Look at this picture! *One man* with easy effort on a *short handle* exerts 100,000 lbs. of jack action! This hydraulic jack (model GB-11) weighs only 111 lbs. Its compactness and many exclusive features are typical of all Blackhawk Jacks.

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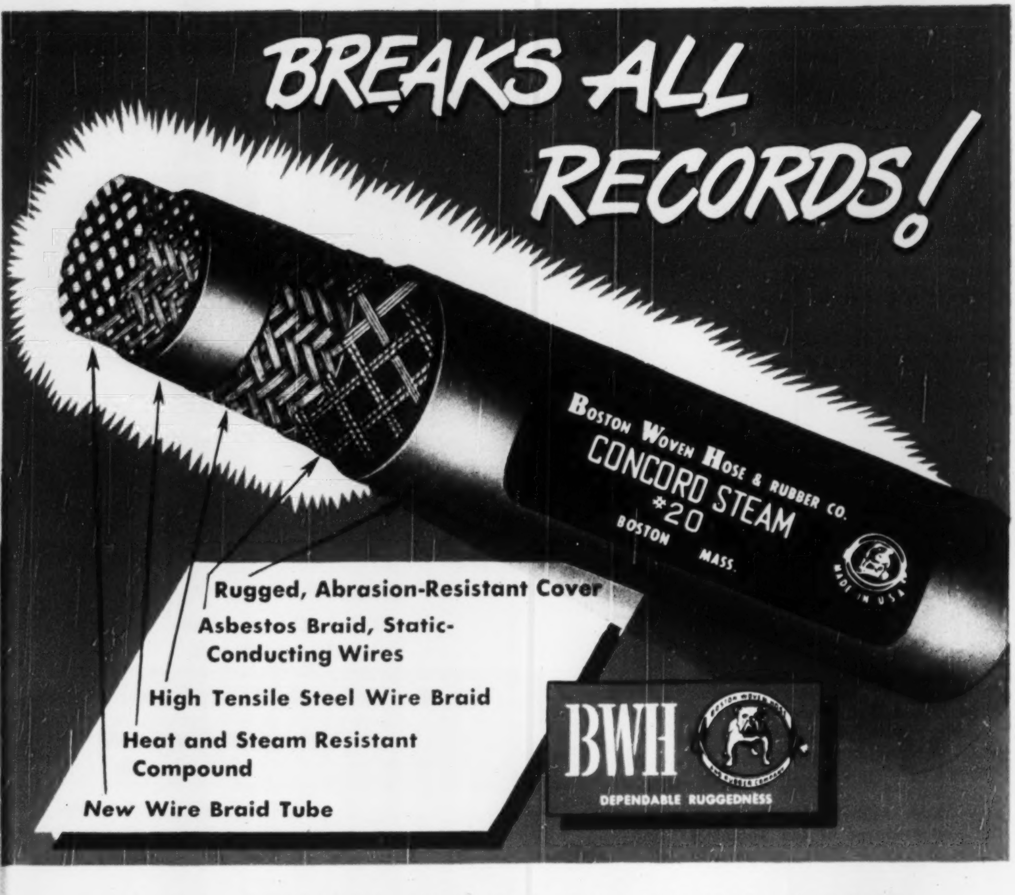
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BOSTON MASS.
MADE IN U.S.A.
Rugged, Abrasion-Resistant Cover
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FIRST STEAM HOSE TO GIVE OVER 2000 HOURS CONTINUOUS SERVICE

at 200 lbs. Working Pressure!

Steam Hose users have long been stymied by the costly problem of tube-swelling during normal service life of ordinary hose. They turned to BWH for the solution.

BWH came up with the answer . . CONCORD #20! In building this revolutionary new hose, the rubber tube was first locked securely between two braids of high tensile steel wire. The cover and static wires were added. Then the new construction was subjected to a *continuous flow* of 200 lbs. steam pressure *for over 2000 hours!* At the end of this record-smashing test, the tube showed no evidence of hardening or swelling! Couplings were re-attached without the slightest difficulty because the original inside diameter of the tube was maintained throughout!

Next to the rugged abrasion-resistant cover is an open weave of asbestos braid which assures cover adhesion and includes new type static-conducting wires.

Ask your BWH distributor to demonstrate the whip-like flexibility of this rugged new hose. Check the braids of high-tensile steel wire which give it strength without bulk. Concord #20 does the job without breaking the operator's back, guards against "flash" explosions and, from the inside out, assures unequalled service life.

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At a meeting of the Texas Good Roads Association the following officers were elected: W. M. Neyland, Corpus Christi, president; J. H. Kultgen, Waco, first vice-president; Henry Reese III, Gonzales, second vice-president; and Gen. Ike Ashburn, executive vice-president.

Duffy Reed of Twin Falls has been elected president of the Associated General Contractors of Idaho. Other officers include C. B. Lauch of Boise, vice-president; L. D. Robbins, Boise, secretary-treasurer; Charles Lewis of Pocatello, Tony Marrazzo of Boise and George Detweiler of Twin Falls, trustees.

The North Carolina Society of Engineers has elected the following officers: H. D. Jones, President, Raleigh, N .C.; Ross H. Reynolds, vice-president, Raleigh, N. C., Leroy M. Keever, reelected secretary-treasurer. Board of directors: O. B. Packard, Wilmington, N. C.; W. H. Rogers, Jr., Raleigh, N. C.; Carroll L. Mann, Jr., Greensboro, N. C.; J. Norman Pease, Charlotte, N. C.

South Carolina Society of Engineers has elected these officers: H. G. Haynes, Charleston, S. C., president; S. N. Pearman, Columbia, S. C., vice-president; Al Johnson, Columbia, S. C., secretary-treasurer. Board of directors: R. S. Pruitt, Anderson, S. C.; S. C. McMeekin, Columbia, S. C.; William Schirmer, Charleston, S. C.

The New York Good Roads Association has elected Harold G. Peet of Pike, N. Y., president. Other officers, Robert C. Burnette, Skaneateles, secretary, and Roy G. Finch, Albany, treasurer. The association was organized by Charles H. Sells, former state public works superintendent.

The Construction Council of Seattle, Wash., has elected Ralph Lane president for 1950, with Vance Tjossem as first, and Oscar Sundberg as second vice-president. Edward B. Scriven was re-elected secretary and R. M. Black treasurer. Named to the board of control were A. W. Barlow, Elmer Coates, James Cole, Jim Dodge, Frank Hardy, J. N. Hutchins, William Leckenby and Fred Nobmann.

Harold N. Peterson of Jamestown, N. Y., was elected president of the Chautauqua-Cattaraugus Chapter, New York State Society of Professional Engineers. Other officers, Chester H. Weatherell, Olean, and Charles E. Kahlke, Jamestown, vice-presidents. Linsley G. Brown and Walter E. Brandt are new directors.

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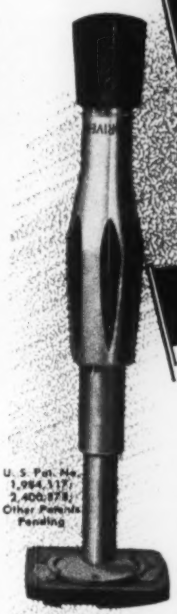
Powder-Actuated Fastening Tool!



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Controlled Power with one powder charge

3-Way Safety • Most of the BANG is out!

Flangeless Drive-pins

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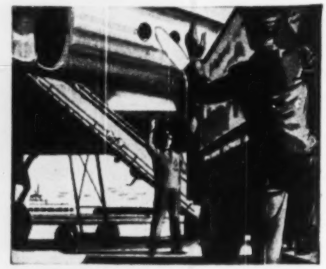
Air Express is the best air shipping buy to keep any business rolling, since low rates include door-to-door service. Answers your problems because Air Express is *fastest* and *most convenient*.



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EDUCATION AND RESEARCH

Technical advisory group

The Stanford, Cal., Research Institute has announced the formation of a technical advisory committee composed of nine leading scientists and research administrators in its San Francisco and Los Angeles areas.

The committee was formed by the institute's board of directors to provide a regular independent review of activities in the organization's major fields of research. Meeting at frequent intervals with the institute's research executives, the members will also review fields of research in which the institute can give greatest service to Western industry.

Air pollution committee

Dean M. P. O'Brien, head of the department of engineering at the University of California, has been named chairman of the recently formed Air Pollution Committee of the San Francisco Bay Area Council.

Serving as a clearing house of technical information, the committee will provide assistance and counsel in analyzing and recommending planning and programs for the control of air pollution in the Bay Area. Members of board of supervisors, health officers, planning technicians, and representatives of industry make up the 33-man committee.

Educational Notes

Soil Mechanics—A one-day soil mechanics and foundation engineering conference was held recently on the campus of the University of Kansas. It was sponsored by the school of engineering and architecture, with Prof. G. W. Bradshaw, of the department of civil engineering, as chairman. It was attended by 138 engineers from Kansas, Nebraska and Missouri.

Advanced building design—Konrad Wachsmann has been named professor of advanced building research and design at the Institute of Design of the Illinois Institute of Technology.

Regional Planning—A course in regional planning at the University of Illinois this spring will feature lectures and discussions by 25 specialists. Karl B. Lohmann, professor of city and regional planning, University of Illinois, is in charge. The course was first held in 1933 but was not vigorously prosecuted during the war period.

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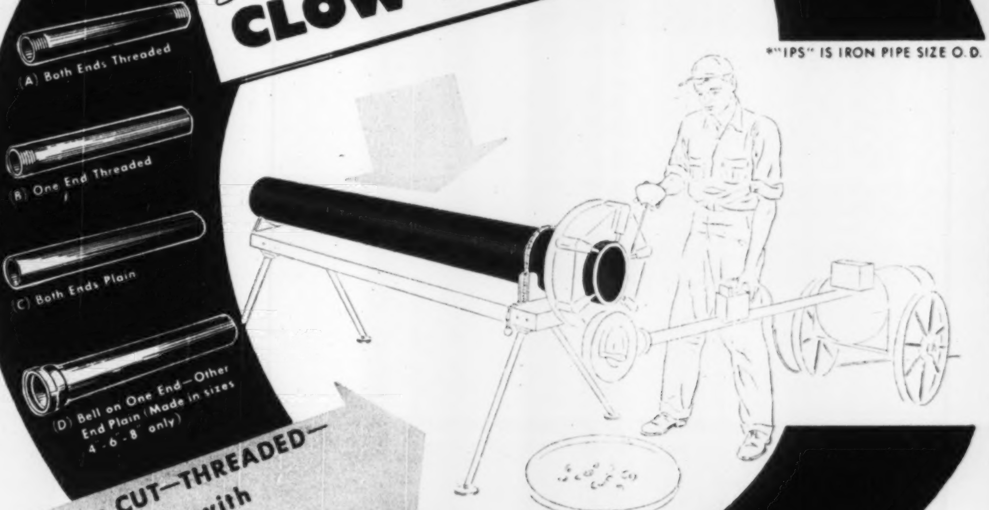
CLOW "IPS"* Cast-Iron PIPE!

*"IPS" IS IRON PIPE SIZE O.D.


(A) Both Ends Threaded
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Ordinary Tools of
the Piping Trade!

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Clow "IPS" pipe (A), (B) and (C) is cast in 18-foot lengths and in sizes 3, 4, 5, 6, 8 and 10 inches. Can be furnished cut to your exact specifications or in full lengths for cutting and fitting on the job.

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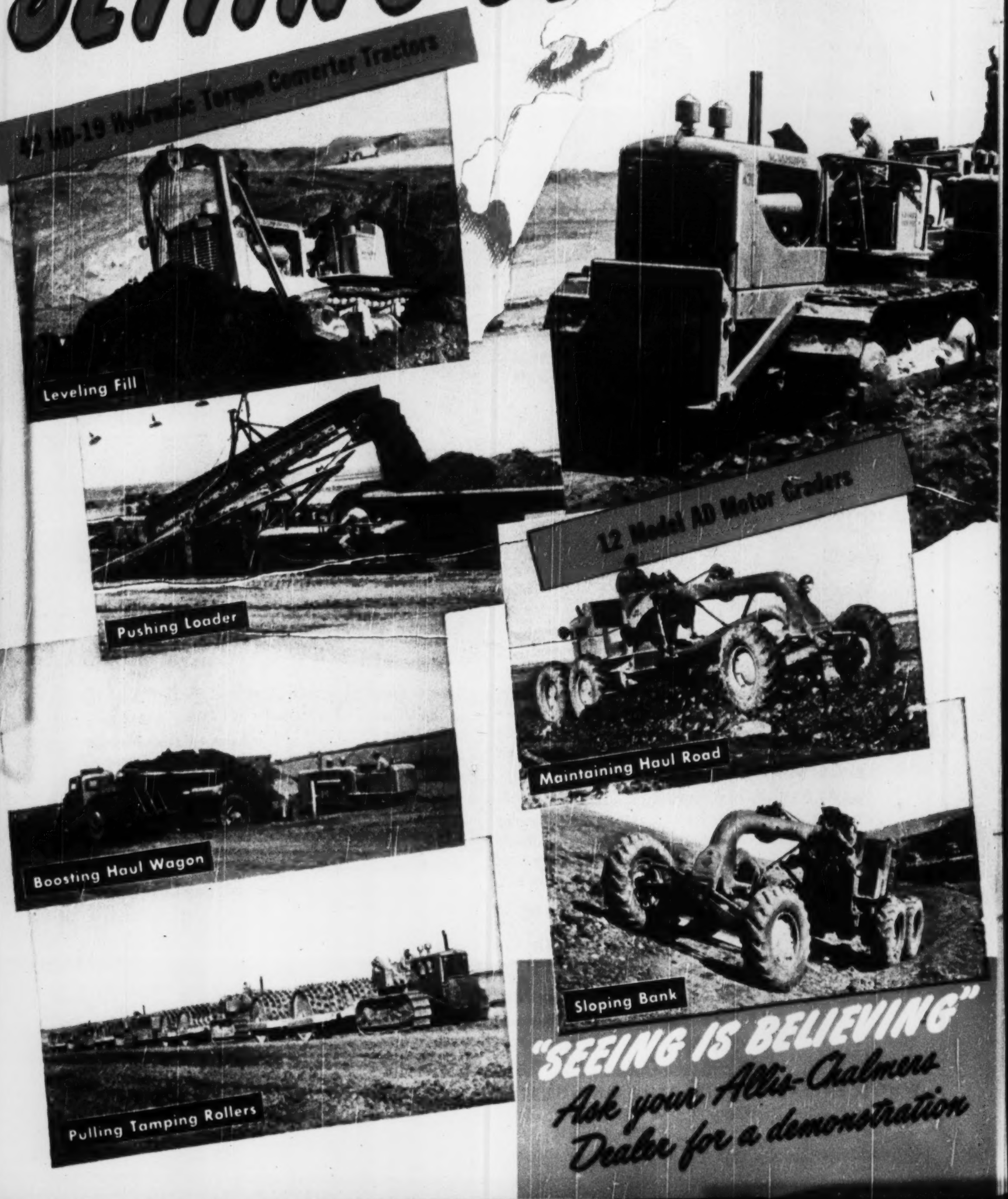

42 HD-19 Hydraulic Torque Converter Tractors

Leveling Fill

Pushing Loader

Boosting Haul Wagon

Pulling Tamping Rollers

12 Model AD Motor Graders

Maintaining Haul Road

Sloping Bank

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RECORD for PETER KIEWIT SONS' CO. and MORRISON-KNUDSEN CO.

on their 18½-million-yard Garrison Dam job in North Dakota, World's Largest Rolled-Earth Fill Dam.

Pulling Loader

Model HD-5 and Tracto-Shovel

Loading Oversize Rock

Fleets of A-C's have set a terrific pace since early in 1949 on this 20-hour-a-day, six-day-a-week job. Production during good weather hit 100,000 yards and more a day! YET DOWNTIME HAS BEEN MUCH LESS THAN THE CONTRACTORS ANTICIPATED—based on previous earth-moving experience.

This outstanding service record again demonstrates that A-C equipment is built to take it. Proves again that extra production time is gained through such advantages as simplified adjustments and repairs . . . electric starting . . . quick, easy removal of major assemblies . . . interchangeability of many GM engine parts on all makes and models of A-C diesel tractors and motor graders. PLUS extended lubricating periods — 1,000 hours on truck wheels, idlers and support rollers.

For more production, for less upkeep, think of Allis-Chalmers when you think of road-building equipment.

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... for the RIGHT hose for every need!

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Hewitt-Robins research chemists know that no one type of hose can meet *all* the problems of industry. That's why they use natural and synthetic rubber, cotton, rayon, nylon, glass, chemicals by the score —in whatever raw material combination is best for each service requirement. Testing engineers torture hose at the plant . . . give it months of wear and tear in a few days. Field engineers the country over help users get the longest service at the lowest cost.

All of which means that the Hewitt-Robins name on a hose means it's *right for its particular job.*

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Whatever your hose needs, it will pay you to put the problem up to hose headquarters. Call your Hewitt Rubber distributor (see classified phone book—"Rubber Products" listing) or write Hewitt Rubber Division, 240 Kensington Avenue, Buffalo 5, N. Y.

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TRANSMISSION BELTING · VIBRATING CONVEYORS, FEEDERS AND SCREENS

Alaska highway work—Some 30 students of engineering from colleges and universities of the Pacific Northwest will engage in summer work this year on Alaska highway construction. John R. Noyes, Alaska's commissioner of roads, recently visited Oregon, Washington and Idaho to enlist the workers. "We like to get engineering students up there after their third year," Noyes said. "It gives them good experience and lets us look them over. Sometimes they get permanent jobs after graduation."

Water supply and sewerage—The Florida Committee on Water Supply and Sewerage Education, under the chairmanship of David B. Lee, director of the Bureau of Sanitary Engineering, Florida State Board of Health, announces that the 18th Annual Short Course and Conference is to be held June 5-10, 1950 in Gainesville. The purpose is to meet the need for a continuous training program for water and sewage plant operators in Florida. The program consists of technical discussions and demonstrations in the morning, and laboratory work, covering bacteriology, water and sewage chemistry, in the afternoons. Examinations for various classes of operators are held at the end of the school. During this school, the State Board of Health issues an official call for all water and sewage plant operators and swimming pool operators to confer with members of the State Board of Health. Sponsoring organizations are: General Extension Division, University of Florida; Florida Water and Sewage Works Operators Association; Florida Sewage Works Association; Florida Section, American Water Works Association; and the Florida Board of Health.

Irrigation engineering—The division of engineering of the Colorado A & M College, Fort Collins, will offer a graduate program in irrigation engineering this summer. Fort Collins is the heart of a vast region of irrigated agriculture, Colorado having the second largest area of land under irrigation in the western states. The terminal reservoir of the Colorado-Big Thompson transmountain diversion project, the largest ever undertaken for irrigation, is within three miles of the A & M campus. The programs, under visiting lecturers of outstanding reputation will be offered in two 4-week summer terms. Requirements for enrollment are a bachelor's degree in civil engineering or successful completion of such courses as applied mechanics, strength of materials, fluid mechanics, and elementary structural design.

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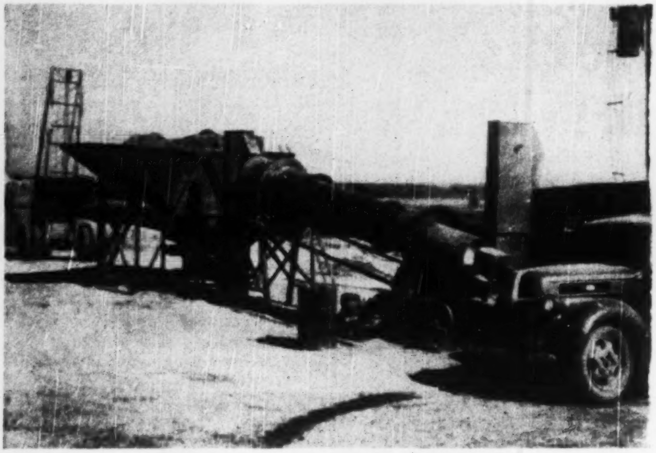
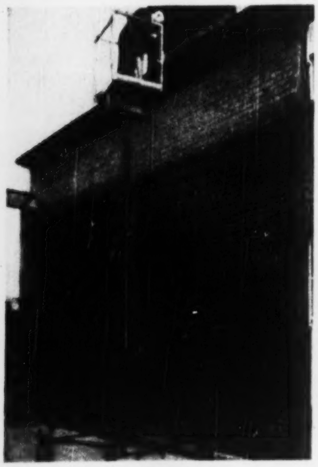
NEW PRODUCTS



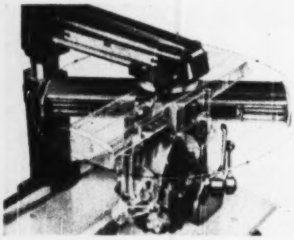
Continuous Hot-Mix Plant Has a 20-Ton Per Hour Capacity

All functions of the Monotrol M-20 are electrically operated from a single control panel. Individually controlled volumetric-type feeder valve for bin compartments permits accurate proportioning of aggregates. Three-section rotating dryer prevents segregation and can eliminate up to 100 percent of moisture; amount of moisture removed is regulated by speed of dryer. Constant accuracy of bituminous mixture is maintained by patented features on hot-aggregate measuring bin and bitumen pump control. Variable-speed transmission permits changing flow of aggregate while machine is in operation. Cut-type rotary mixing screw in pugmill assures thorough coating of aggregate. The plant is built in sections which are easily assembled on the job. Largest single unit weighs 3,000 lb.—Wayne Crane Division, American Steel Dredge Co., Inc., Fort Wayne, Ind.



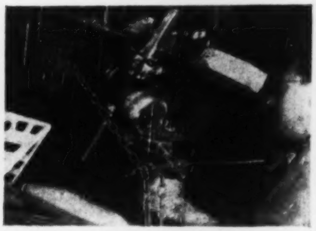
Hydraulic Working Platform

Mobile unit quickly lifts a working platform to a height of 17 ft. It is one-man operated and has a 2 ft 3 in.-sq platform provided with folding toe boards and handrails. When collapsed, the Beanstalk has an over-all height of 6 ft 6 in. and a width of 2 ft 5 in. The manual hydraulic pump is actuated by the operator while standing on the platform.—Wm. Moss & Sons, Ltd., Mechanical Developments Division, N. Circular Road, Cricklewood, London, N. W. 2, England.



Simplified Woodworker

Improved Delta Multiplex engineering design has resulted in a woodworking machine which uses two instead of the three circular movements usually employed in radial-type units. Known as double radial action, it works at a center pivot position above the saw table. Power unit can be located at any position including vertical. By using different attachments, over 125 woodworking applications are accomplished with this machine.—Rockwell Mfg. Co., Power Tool Division, 600 E. Vienna Ave., Milwaukee 1, Wis.



Portable Electric Drill

Portable drill press is designed for use with any $\frac{3}{8}$ to $\frac{1}{2}$-in. electric drill. Weighing 26 lb, this drill press may be used as a shop tool, on a workbench, or may be dismounted to secure drill press action in hard-to-reach spots. The electric drill is held in place by a patented clamp. Leverage for Port-A-Drill is provided by anchoring sturdy steel chain and applying pressure on lever arm.—Sudenga Iron Works, George, Iowa.

Aluminum Pole Derricks

These utility-type pole derricks are manufactured of Alcoa aluminum. They represent a weight savings of about 50 percent over similar units of standard materials. When mounted on trucks, the derricks find wide application in the placement of telephone and utility poles.—Eagle Mfg. Co., Div. of The Four Wheel Drive Auto Co., Appleton, Wis.; or, American Coach & Body Co., 9503 Woodland, Cleveland, Ohio.

Triangular Scale

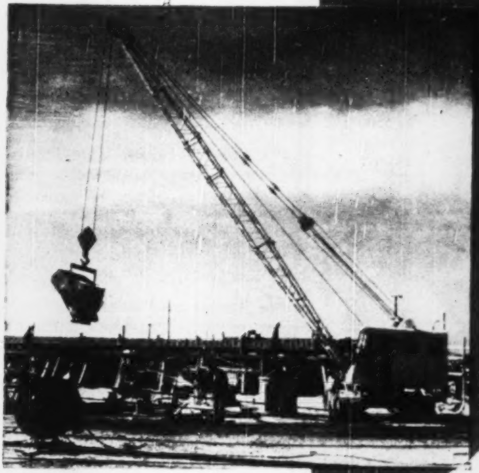
Dimensionally stable triangular scale is made of rigid Vinylite plastic sheets gripped by an aluminum core. Neither the plastic nor the core are subject to warping, and the fins and core are interlocked by a special process which allows for the different expansion coefficients of the two materials. Markings on white edges of the scale fins are applied by a special process and then

(*Continued on page 244*)

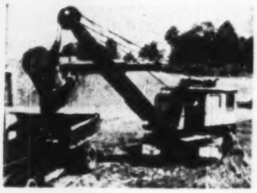
Everything Contractors want in an Excavator

MARION 33-M

3/4 to 1 CUBIC YARD



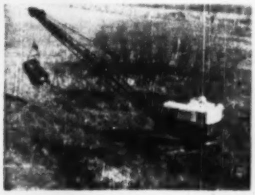
33-M CRANE



33-M SHOVEL

33-M
PULL SHOVEL

33-M CLAMSHELL



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Quality Materials Shafting of alloy steel. Gears are heat treated. Grooved drums of alloy cast steel mounted on ball bearings. Crawler rollers and crawler pads are forgings. All gears machine cut.

Welded Construction Maximum strength without cumbersome weight. Positive rigidity and assurance of lifelong alignment.

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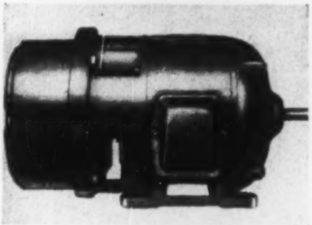
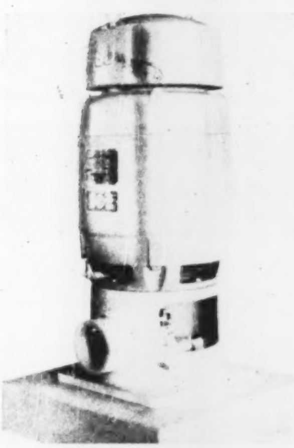
coated with a Vinylite resin-base liquid so they will withstand continuous wear.—Wolsey Co., Inc., 727 Kohler St., Los Angeles 21, Calif.



Brake Motor and Brake

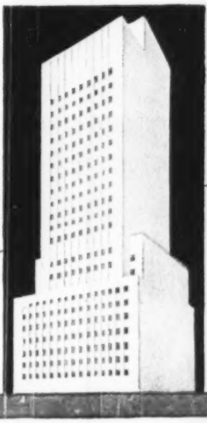
Compactness, simplicity of design, and complete dependability for applications requiring frequent instantaneous stopping and starting are features claimed for the new C-W brake motor. It has prelubricated-for-life cartridge bearings and a new brake lining that eliminates the need for adjustments. It uses bonded metal brake linings and can be mounted on dripproof, splashproof or totally enclosed motors to make a matched brake motor in ratings from 1 to 60 hp. Available separately for mounting on NEMA standard D-flange motors in frames 203-326 or C-face motors in frames 364-405 with standard double-shaft extensions.—Crocker-Wheeler Electric Mfg. Co., Ampere, N. J.

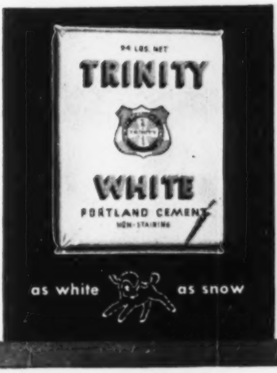


Deepwell Turbine Pump

Compact pump is designed primarily for wells of 5 or 6-in. dia. It can be secured with or without a pressure tank. The Bee-Jay has a low operating speed of 1,750 rpm. Water lubrication is featured and the pump can be driven either by direct connection to a vertical hollow-shaft electric motor by right-angle gear drive, or quarter-turn flat-belt drive on a

(*Continued on page 246*)





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Now You Can Get Maximum Work Capacity

But you require more than engine power alone . . . you must have stability. Every action has an equal and opposite reaction. The hook load limit is what your machine will lift without losing its stability. P&H excels in lower center of gravity . . . in better weight distribution . . . resulting in a higher ratio of lifting capacity in relation to gross weight. Thus, stability is actually a measure of lifting capacity. P&H gives you more of it. You can prove it for yourself.

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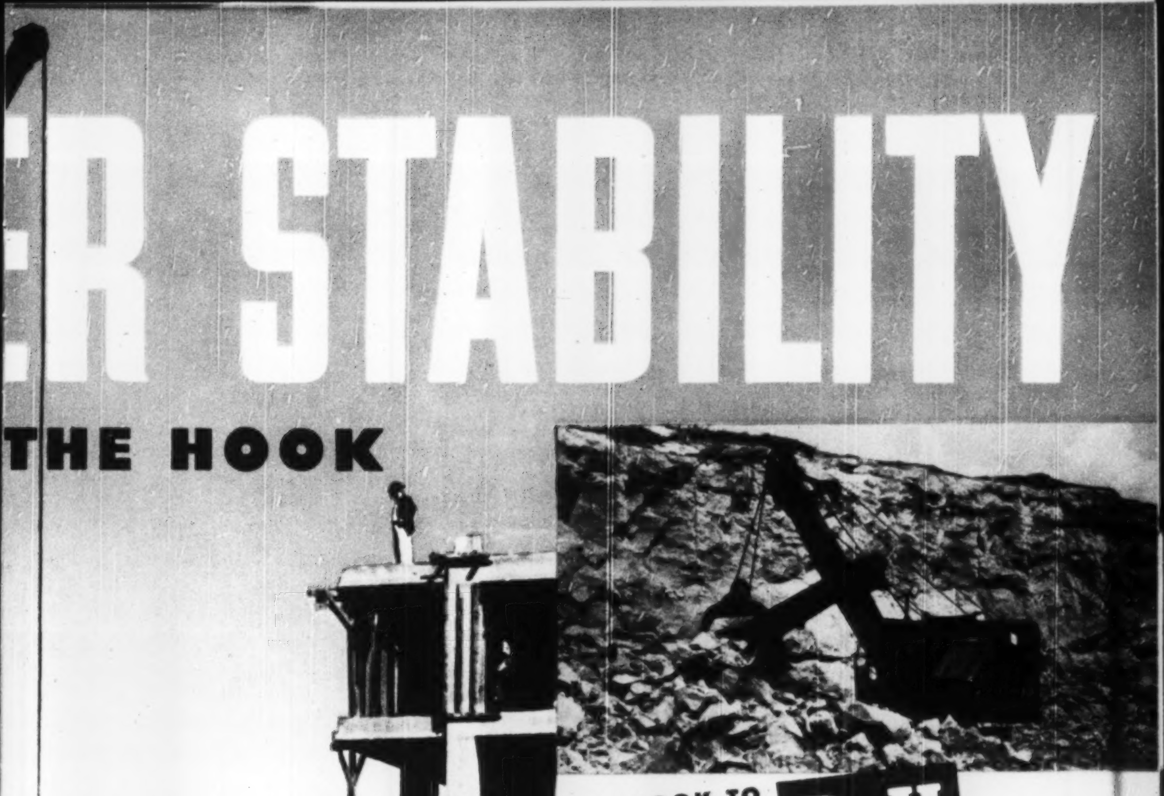

ER STABILITY

THE HOOK

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GIVES YOU MORE POWER AT THE TOOTH POINT

Stability is the major function of digging power, too. The same stability which gives P&H greater lifting capacity also gives you more tooth point digging power. Without useless deadweight, you have more power available . . . faster overall operation . . . lower production costs.

1. All welded construction of rolled alloy steels . . . originated by P&H . . . more highly developed by P&H.

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3. Low pressure hydraulic control is smoother . . . more responsive . . . easier on both operator and machine.

4. Rapid reversing planetary chain crowd gives you faster, more positive bite. Crowd chain outlasts 20 to 30 crowd cables.

5. Simpler design gives you an easier machine to work on . . . simplifies maintenance . . . reduces lay-up time . . . cuts costs.

Only P&H gives you these Added Value features and at no extra cost.

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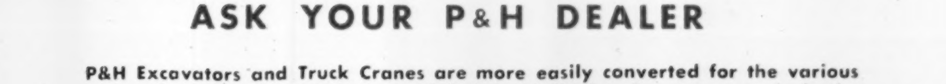
P&H Excavators and Truck Cranes are more easily converted for the various types of service shown below — with hoist and digging drums on one shaft, the need for auxiliary shafts and gearing is eliminated. You also have a choice of gas, Diesel or electric power. Ask for literature on the size you need.



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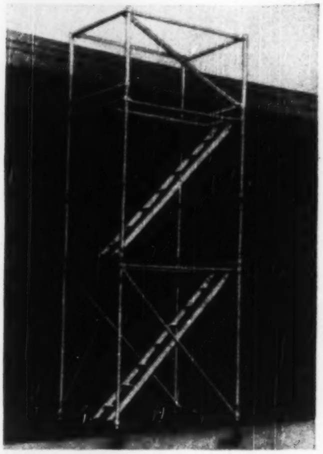
gasoline or diesel engine. Four models (12, 15, 16, and 23 stage) are offered.—Byron Jackson Co., Pump Division, P. O. Box 2017, Los Angeles 54, Calif.

Tractor-Wheel Attachment

Increased traction under conditions where rubber will not hold is the purpose of the Retracta-Matic tractor-wheel attachment. Once bolted to the wheel, it says on, instantly and automatically ready for use when needed. Removing one safety bolt, opens it for use. Being retractable, its presence on the tire does not interfere with normal operation. Weight is 275 lb. per pair.—Ariens Co., Brillion, Wis.

Arc-Welding Electrode

Reserve-polarity dc rod is designed specifically for vertical and overhead welding of all types of joints in mild steel. High tensile strength and ductility with good impact resistance are featured properties of the W-22 electrode (AWS Class E 6010) welding bead. It can be used to repair castings because of its low-volume slag-forming characteristics.—General Electric Co., Apparatus News Bureau, Schenectady 5, N. Y.



Aluminum Rolling Scaffold

Sectional-type scaffold is offered in two types—stairway or ladder. These aluminum scaffolds are light, easy to erect, and neat in appearance. Bottom sections, including non-elevating casters, are 7 ft 3 in. from ground to first platform. Each additional section is 6 ft 8 in. high. Base dimensions are 4 ft 6 in. x 6 ft. Two types of 5-in. steel casters are available—a non-elevating type and an adjustable type with a steel screw providing additional height. Frames

(Continued on next page)

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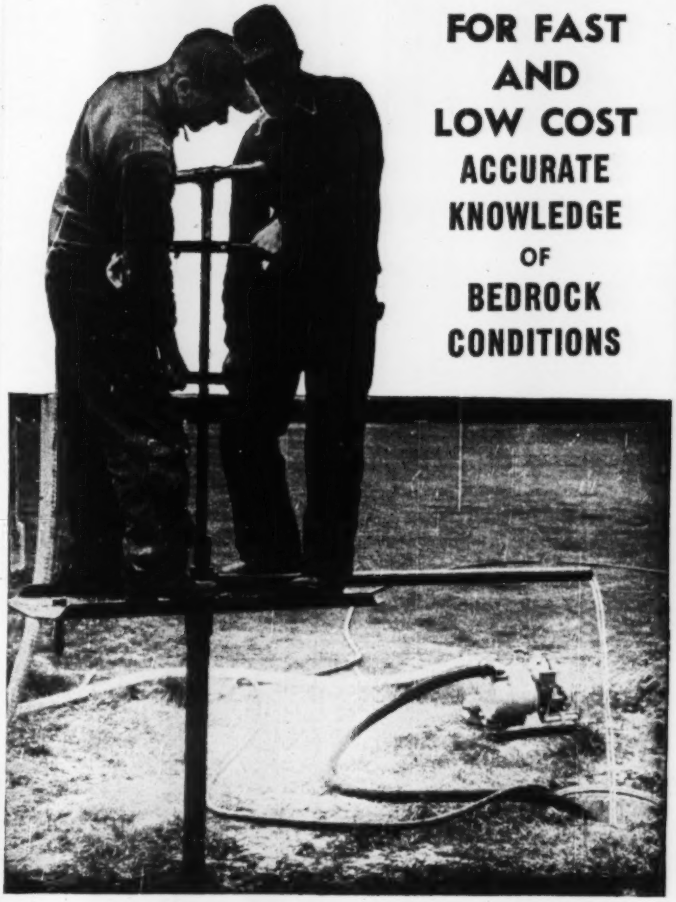
ACCURATE
KNOWLEDGE
OF
BEDROCK
CONDITIONS



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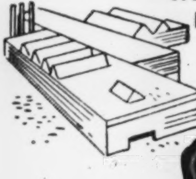

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Roof Drain

Series 0310-5-R
Ramp Drain

BRIDGES

Series 030-S
Bridge Drain

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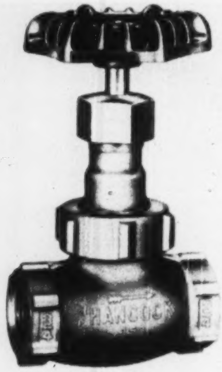
for intermediate sections slip over a sprocket in the low section. This joint is secured by a hinged pin for extra safety. A spring lock is used to secure horizontal members.—THE PATENT SCAFFOLDING CO., INC., 38-21 TWELFTH ST., LONG ISLAND CITY 1, N. Y.

Ten-Inch Slide Rule

The Pickett 800 log log slide rule features the use of a double, or back-to-back scale. Features of this scale are: It places the six log log mated scales together to make three double scales with numbers and their reciprocals back-to-back for greater accuracy and easier reading; provides a C scale on both sides; permits inclusion of the DI scale; and the additional blank space made available results in a simpler-looking easier-to-use rule. All scales are decimally divided.—PICKETT & ECKEL, INC., 5 S. WABASH AVE., CHICAGO 3, ILL.



Bronze Valve

The "500 Brinnell" Hancock bronze valves have stainless steel seats and disks and a diaphragm construction claimed to be exceedingly strong. They are manufactured in sizes of $\frac{1}{4}$ through 2 in., and are available in globe and angle types, screwed ends. The Hancock valves are designed for all pressures up to 150-lb saturated steam; or 300 lb for non-shock cold water, oil, or gas.—MANNING, MAXWELL & MOORE, INC., WATERTOWN 72, MASS.

Cast-Iron Electrode

All-State No. 8 electrode is recommended for general welding of cast iron and especially where free machinability and color match are required. It is designed for ac or dc straight or reverse polarity and amperages ranging from 40 to 180, depending on diameter. Tensile strength is 30,000 to 50,000 psi. Advantages claimed include smooth deposit, easily

(Continued on page 249)

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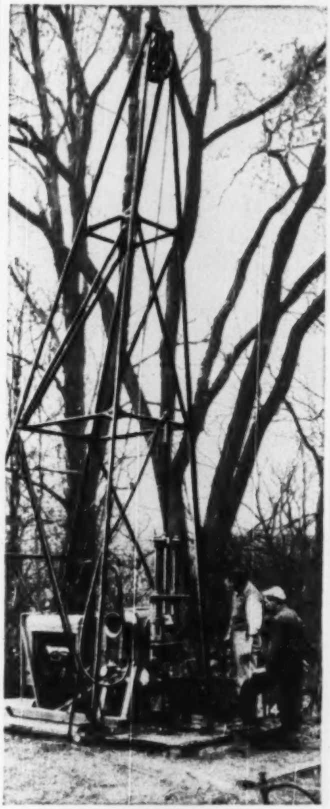
*Teredo

We call our new core drill the "Teredo" because it will out-bore any other machine of its size. This light, compact, portable core drill will recover cores up to $2\frac{1}{8}$" in diameter and operate at depths to 600'. It can be mounted on drag skids, jeep, truck or trailer; and powered by air motor, electric motor, gasoline or diesel engine or truck take-off. It's simple, rugged and relatively inexpensive.
Either mechanical screw feed or hydraulic feed can be furnished.
Send for Bulletin 30



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2

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Stop that waste!

BUILD DURABLE, HIGH DENSITY, STRONGLY KEYED, LOW COST ROADS WITH THE

NEW SEAMAN SELF-PROPELLED TRAV-L-PLANT

NEW SEAMAN Self-Propelled TRAV-L-PLANT. Mixing width: 7 ft. Gas or Diesel powered. Equipped with spray bar, pump, pump tachometer, and tachometer wheel. For bitumen or water.

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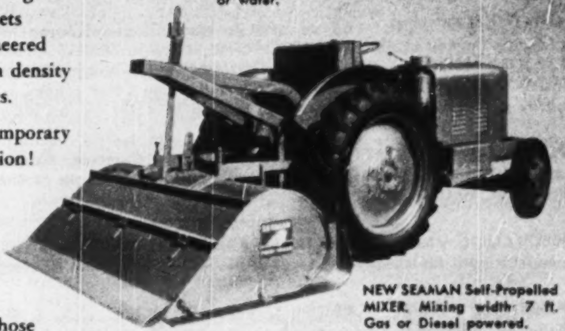
Today, with the SEAMAN Self-Propelled MIXER or the Self-Propelled TRAV-L-PLANT mixing and blending of binder, aggregates and fines are so thorough and so scientifically correct that pavements of those types endure for years. And the SEAMAN produces such a remarkably high hourly tonnage and is so economical in labor that construction costs easily meet limited budgets.

So, do your mixing with a SEAMAN. Stop the waste that robs new construction funds.



NEW SEAMAN Self-Propelled MIXER. Mixing width 7 ft. Gas or Diesel powered.

Here's a folder completely describing the NEW SEAMAN Self-Propelled TRAV-L-PLANT and the NEW SEAMAN Self-Propelled MIXER. Send for it—now.

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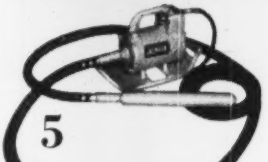
1 **MASS CONCRETE VIBRATOR:** This machine has a tremendously impressive record on nearly all of the nation's large dam projects.

2 **MUNICIPAL PAVING UNIT:** (consisting of electrically vibrated, manually guided paving machine and portable power plant) a great producer, ideal for MUNICIPAL PAVING, BRIDGE DECKS and HIGHWAY WIDENING. Strikes off to all crowns, undercuts at curb or sideform, works right up to and around manholes and other obstructions. Inexpensive.

3 **SIDE FORM VIBRATOR:** Works equally well mounted ahead of finisher, screed or in rear of spreader. Controlled by finisher operator. Saves better part of two men's labor. Will not penetrate through concrete to subgrade.

4 **SOIL COMPACTOR:** Can be used to tremendous advantage in compacting granular backfill in BRIDGE APPROACHES, close to BRIDGE ABUTMENTS, under FACTORY FLOORS, along side FOUNDATIONS, under FOOTINGS, RAMPS, MUNICIPAL PAVEMENTS, SIDEWALKS and many other places. One man can easily guide two side by side. Delivers up to 4500 ½-ton blows per minute.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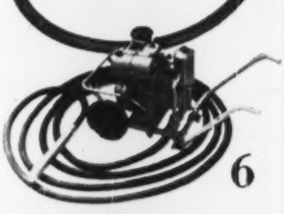
5 **FLEXIBLE-SHAFT, ELECTRIC VIBRATOR:** 2½ HP motor. Operates from light socket, 115 volt, single phase AC or DC, with any length of shaft up to 28'. 8,000 to 10,000 VPM.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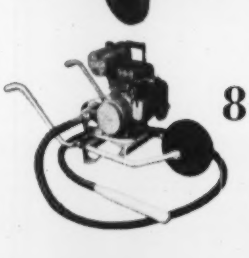
6 **HYDRAULIC VIBRATOR WITH 50 FT. REACH:** Powerful (7 HP), dependable and efficient. Reaches hard-to-get-at places with minimum moves of power unit.

7

7 **PORTABLE POWER PLANTS:** Three models. 1.25, 2.5, 5 KVA capacities. Generate both single phase and 3-phase 110 volt, 60 cycle AC and are equipped with permanent magnet generators requiring no adjustment or maintenance. For operating all types of vibrators, contractor's tools and lights.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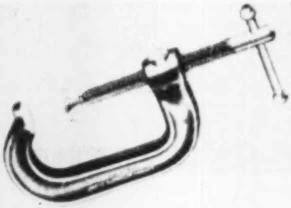
8 **ENGINE-DRIVEN FLEXIBLE-SHAFT VIBRATOR:** The finest in its class, for both thin and thick sections. Ample power (4.7 HP).

AND MANY OTHER VIBRATORS for every type of concrete placement. FOR SALE OR RENT at Jackson distributors. Write for free copy of our handy "POCKET GUIDE." Describes complete line.

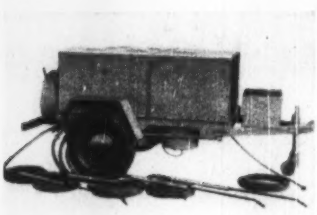
ELECTRIC TAMPER & EQUIPMENT COMPANY • LUDINGTON, MICH.

removed flux residue, welds cold, avoids cracking and distortion, no fumes, and all-position operation.—ALL-STATE WELDING ALLOYS CO., INC., 273 FERRIS AVE., WHITE PLAINS, N. Y.



Quick-Setting C-Clamp

Clutch action of C-clamp permits quick setting for any size material. The clamp is closed on the material by depressing the clutch button; a tight grip is secured by tightening the clamp in the usual manner. Once tightened down, the clutch cannot be disengaged until the pressure is removed. The Gordon automatic G-clamps are available in 4, 6, and 18-in. sizes. They are made of forged steel, stressed relieved after forging. The clutch arrangement is also available for a machinist's vise which has a 4½-in. vise opening — LOCKREY-FATER CORP., 401 BROADWAY, NEW YORK 13, N. Y.



Heavy-Duty Steam Cleaner

Dual-purpose unit can be used for heavy-duty steam-cleaning operations, or as a heat generator for melting tanks of viscous fluids, thawing frozen culverts, and similar heating functions. As a steam cleaner, the Super-Duty Hypressure Jenny has a 300-gal-per-hr capacity and will operate from one to four cleaning guns. Full operating pressure is reached within two minutes from a cold start. As a heat generator it has an output equivalent to a 25-hp boiler. Unit is available in trailer-mounted, portable, or stationary models. Weight is 1,600 lb.—HOMESTEAD VALVE MFG. CO., CORAOPOLIS, PA.

Drills for Masonry

Cutting angles, scientifically ground for fast drilling, are the feature of the Badger drill designed for cutting holes

(Continued on page 252)

38-foot glued laminated beams support roof structure of freight terminal.

Glued Laminated Beams

Cambered and tapered beams provide primary structural members for roof of this gymnasium. The Architects: Johnson, Bain, Brady & Grainger, Seattle, Washington.

...a common sense answer for moderate spans...

at low costs

Unobstructed floor space in moderate spans is provided by glued laminated beams engineered and manufactured by Timber Structures, Inc. These "shop grown" members are formed of kiln dried structural quality material welded under pressure with permanently bonding glues. They are stronger than sawn timbers of equal size, and will not shrink, check, twist or warp.

Achieve Beautiful Architectural Effects

When left exposed, glued laminated beams serve not only as structural members, but also help carry out the decorative theme of the architect and engineer. Surface may be planed, sanded or adzed; finish may be paint, stain or hand rubbed.

Camber may be incorporated as desired when the beam is being formed. By tapering the cambered beam, primary structural members are obtained for supporting the entire roof structure.

Detailed information on glued laminated beams and other structural members may be obtained by consulting the nearest Timber Structures office, or fill in and mail the coupon below.

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Offices in Boise, Idaho; Eugene, Oregon; Kansas City, Missouri; Lawrenceville, N. J.; Chicago; Dallas; New York; Seattle; Spokane

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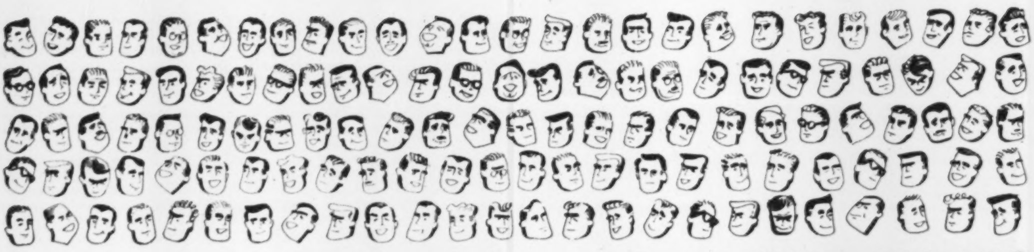

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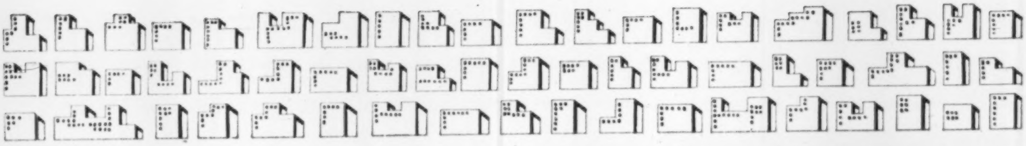
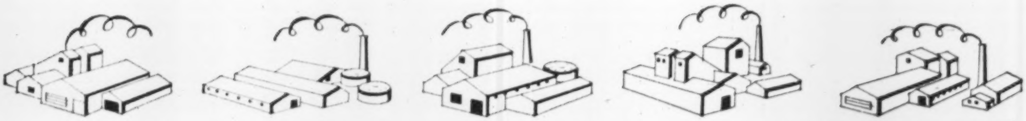
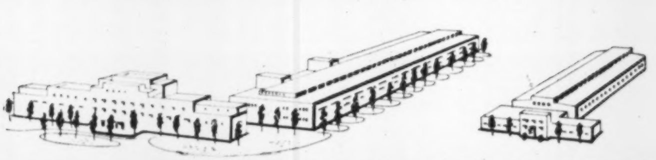


58 SALES OFFICES



5 MANUFACTURING LOCATIONS



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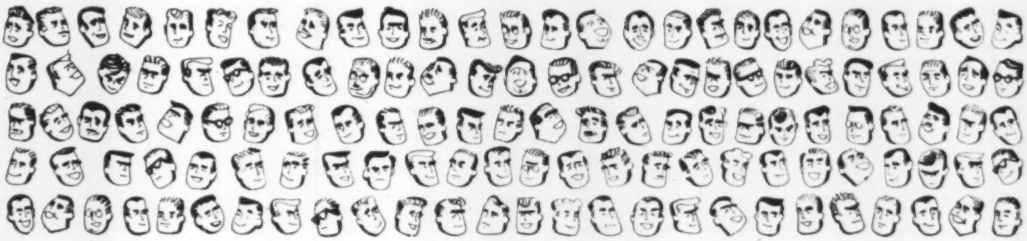

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Its facilities include more than 250 field representatives with headquarters in 58 cities. It also comprises a staff of competent installation instructors who explain recommended installation practices to pipe-laying crews. This Johns-Manville service is an important factor in helping to assure the installation economies as well as the long-term *overall* economies that go with Transite Pressure Pipe.

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And back of all this is engineering—and research. For without them, the plus values that have been built into Transite Pipe would not have been possible. Today, in the new J-M Research Center, the engineer and the technician continue to find new answers to old problems. Their work is an indispensable part of the complete Transite Pipe service which Johns-Manville offers the water works industry. For further information, write Johns-Manville, Box 290, New York 16, N. Y.

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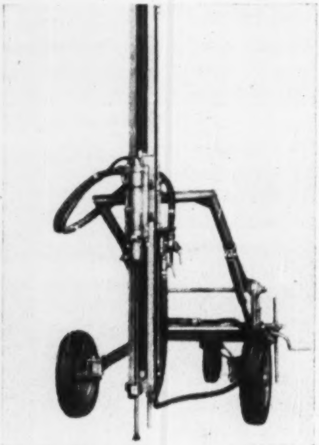
in brick, concrete, tile, stone, and similar materials. The Badger fits all standard electric or rotary air tools and permits drilling in glazed surfaces without breaking the polished surface. Chuck can be used as a stop gage by regulating the length of the drill. Unit features removable, sintered carbide blades. Sizes from ⅛-in. up.—A. E. KLIEBHAN & SONS, 2261 N. 63RD ST., WAUWATOSA 13, WIS.

Speed Reducer

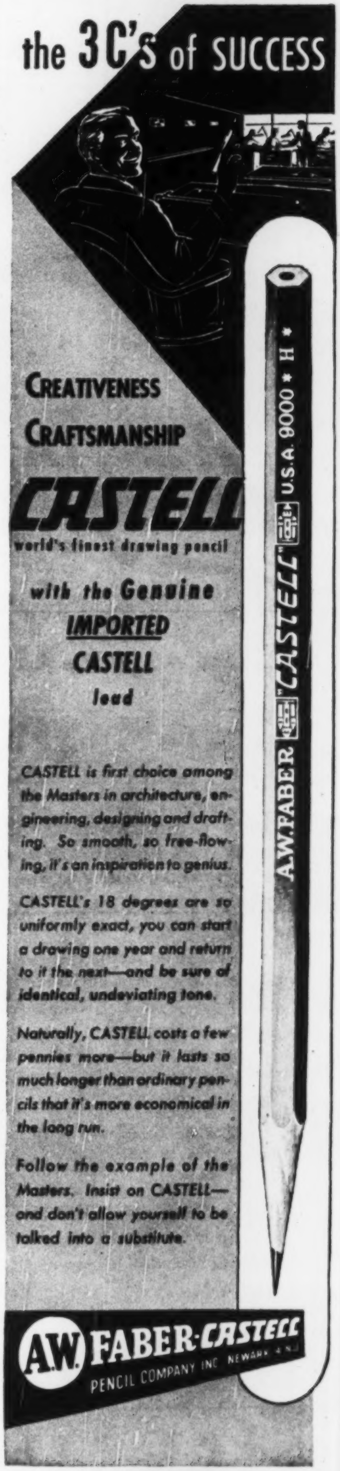
Torque-arm speed reducer has a fixed ratio of 15:1. It can be driven through any V-belt or flat-belt drive. Output speed from 13 to 133 rpm can be obtained through the use of stock sheaves. The unit mounts directly on the shaft to be driven. A bushing keyed into the sleeve adapts the sleeve to any desired shaft size. A torque arm anchors the reducer and provides quick, easy adjustment of belt tension through a turnbuckle. Unit is made in six sizes with capacities to 28.5 hp.—DODGE MFG. CORP., MISHAWAKA, IND.



Drill Has 4-Inch Drifter

The WDR-126 wagon drill has a 4-in. drifter and will drill holes at any angle, in any direction, to a depth of 24 ft or more. It will drill flat holes at any point from 2 in. to 9 ft above ground. Air feed is continuous and it is never necessary to slide

(Continued on page 255)



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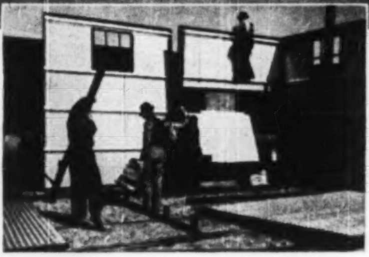
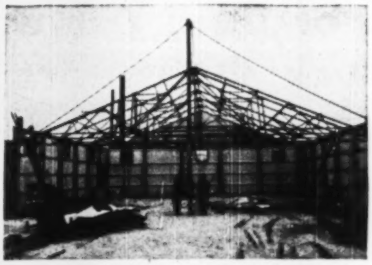


Up she goes—easy does it!



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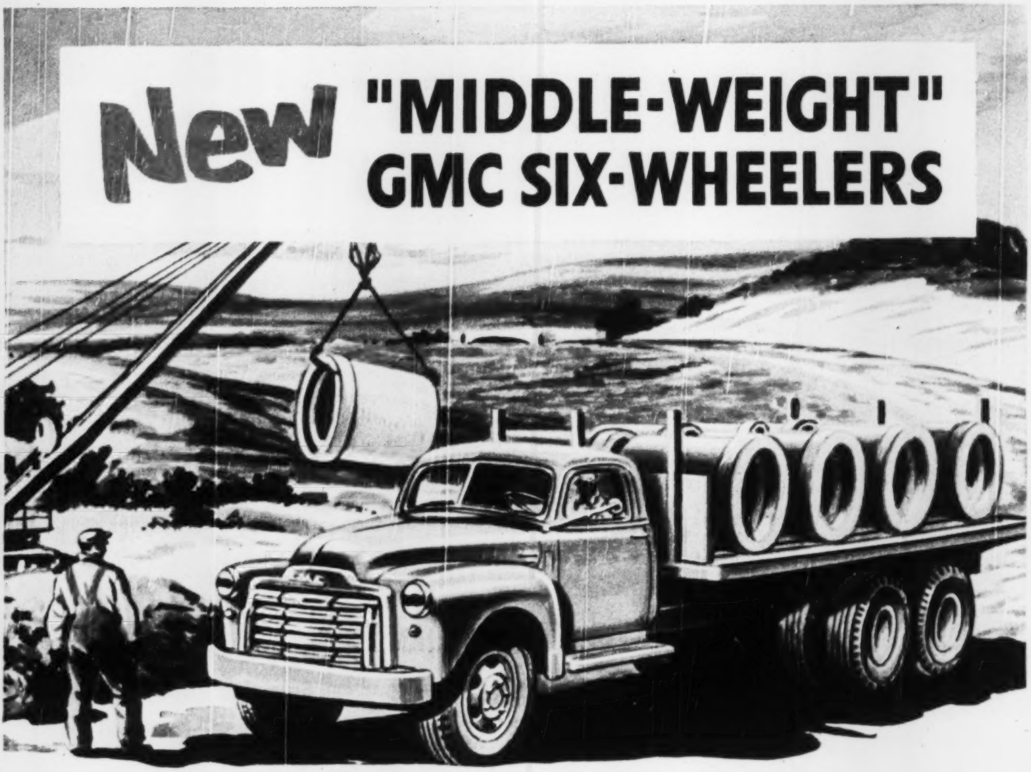
New "MIDDLE-WEIGHT" GMC SIX-WHEELERS



Bringing the Advantages of Dual Drive Design to Many More Truck Operators

Here's welcome news for contractors, road builders and other truck users who need trucks combining great tractive ability with low gross vehicle weight.

These new GMC series "400" and "620" 6-wheelers answer every requirement of these vocations. In the bargain they give you the plus values of GMC engineering and design . . . in powerful valve-in-head engines that are basically the same as "the Army's Workhorse" . . . in modern, wide-vision, extra comfort cabs . . . in rugged, truck-built chassis that include such outstanding features as wholly new, high efficiency dual drive axles, bumper bar grilles, recirculating ball bearing steering, Syncro-Mesh transmissions, frames of 11.1 and 16.03 section modulus.

These new GMCs offer a long-desired lower cost way of hauling big loads, on or off the roads. Let your GMC dealer give you the highly acceptable facts and figures for your particular job.

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a guide shell or change the set-up by hand in order to get a full steel change. The WDR-126 will blow any hole clean. U-bar is raised or lowered by built-in twin jack-screw mechanism. Main wheels swivel 90 deg for line drilling and 180 deg to obtain narrow tread. Wheels are easily locked in any position. The WDR-126 Golden Anniversary model is part of the line celebrating Schramm's 50th year of manufacturing.—SCHRAMM, INC., WEST CHESTER, PA.

Cooling Tower

Carrier cooling towers permit recirculation of water in self-contained air-conditioning units with a minimum of loss. They are available in four models, ranging from 5 to 15 tons of refrigeration capacity. Fill material, over which water sprays to dispense heat removed from air-conditioned area, is waterproof asphalt-impregnated board. The unit has a water-turbine drive, and the only electrical connection needed is for a small pump which is apart from the tower itself. The cooling tower requires a 36x36-in. floor space, and stands 7-ft high.—CARRIER CORP., SYRACUSE, N. Y.

Combination Powered Eraser

Three-purpose electric tool can be used as an eraser, burnisher, or pencil sharpener. Features include 3,000-rpm eraser speed, vibrationless motor to permit pin-point accuracy in erasing fine detail, light weight of 12 oz, sliding snap-type switch, and quick-action chuck. Burnisher at opposite end of eraser shaft has a ball point for smoothing erased areas. Rotating abrasive disk at base of burnisher sands pencil or compass leads to needlepoint sharpness.—DREMEL MFG. CO., RACINE, WIS.

Packaged Bin Units

Line of 78-in. bin units has application for flat storage, tool storage, box and small-parts storage, and display of

(Continued on next page)

CONTRACTORS AND CONSTRUCTION ENGINEERS--
Investigate
KRANE KAR
MOBILE SWING-BOOM CRANE

Equipped with Clamshell Bucket.

Loading truck with sheet rock.

ECONOMIZE by letting **KRANE KAR** expedite work in your shop, yard, and on project site. This lively swing-boom crane dismantles and assembles machinery; loads and unloads vehicles; carries and places lumber, steel, stone, pipe, concrete forms, compressors, pumps, etc. **KRANE KAR** will quickly repay its own cost . . . in savings you need to compete and to complete present jobs at a profit. 1½, 2½, 5, and 10 ton capacity. Our sales-engineer will be glad to advise you. Write for Bull. 54.

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Novo's line of self-priming centrifugal pumps has been redesigned to use air-cooled engines. This results in lower original cost and decreased weights without loss of pumping efficiency. A.G.C. rated capacities from 3,000 to 40,000 G.P.H. Units available skid-mounted, two steel wheels or pneumatic tired. Write or wire for specifications.

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ENGINES
Air-cooled, 4 to 8 H.P.
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AGAIN MORRIS HELPS—
THIS TIME TO BUILD
CLEVELAND'S AIRPORT

The 12" MORRIS Dredge "Johnnie Wells," once sunk, and raised now working on the new Cleveland Airport fill.

Originally Equipped in 1927 by Morris Machine Works for a Buffalo, N. Y., project.

Moved to Huron, Ohio, for harbor work.

Sunk in Storm enroute to Bay City, Mich., while off Pelee Island.

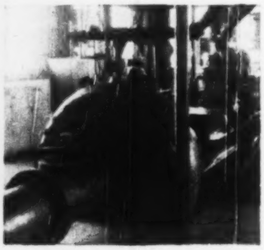
Raised and Salvaged by L. A. Wells Construction Co.

Back in Service on various dredging contracts after motors and electrical equipment were dried and cleaned.

And in 1949—A vital fill-in job at the new Cleveland Lake Front Airport called for exacting specifications. It was the "Johnnie Wells" that met them—this time with a new hull, a new heavy duty MORRIS dredge pump driven by a 500 H.P. Diesel engine to replace the old motors.

Over 120,000 cu. yds. a Month have been moved by this 12" MORRIS Dredge.

The story of the "Johnnie Wells" proves that there's material and engineering "guts" in a Morris Portable Dredge. *For dependable, efficient service, maximum output with a minimum of power and maintenance, year in—year out economical performance*—BUY MORRIS. For details about this type and other Morris Dredges, write today for BULLETIN 177.



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parts or small items. Bin units are 3 ft. wide, 1 ft. deep, and 6½ ft. high. Dividers in all bins are adjustable horizontally at 1-inch intervals using Lyon Snap-ins—no nuts, bolts, or tools are required. Shelves are adjustable up and down every 1½ in. where dividers are not used.—Lyon Metal Products, Inc., Aurora, Ill.

Translucent Building Panel

Featherlight strands of glass fiber and colorful plastic combine to produce Alsynite, a translucent plastic paneling. Alsynite weighs 8 oz./sq.ft., and can be sawed, drilled, or nailed. It is produced in six colors, in three corrugation patterns, in standard size sheets ranging from 8 to 12 ft in length and from 26 to 40 in. in width. Under tests, it has withstood a barrage of ice pellets, some nearly 2 in. in dia., traveling at speeds between 40 and 60 mph.—Allied Synthetics Co., San Diego, Calif.

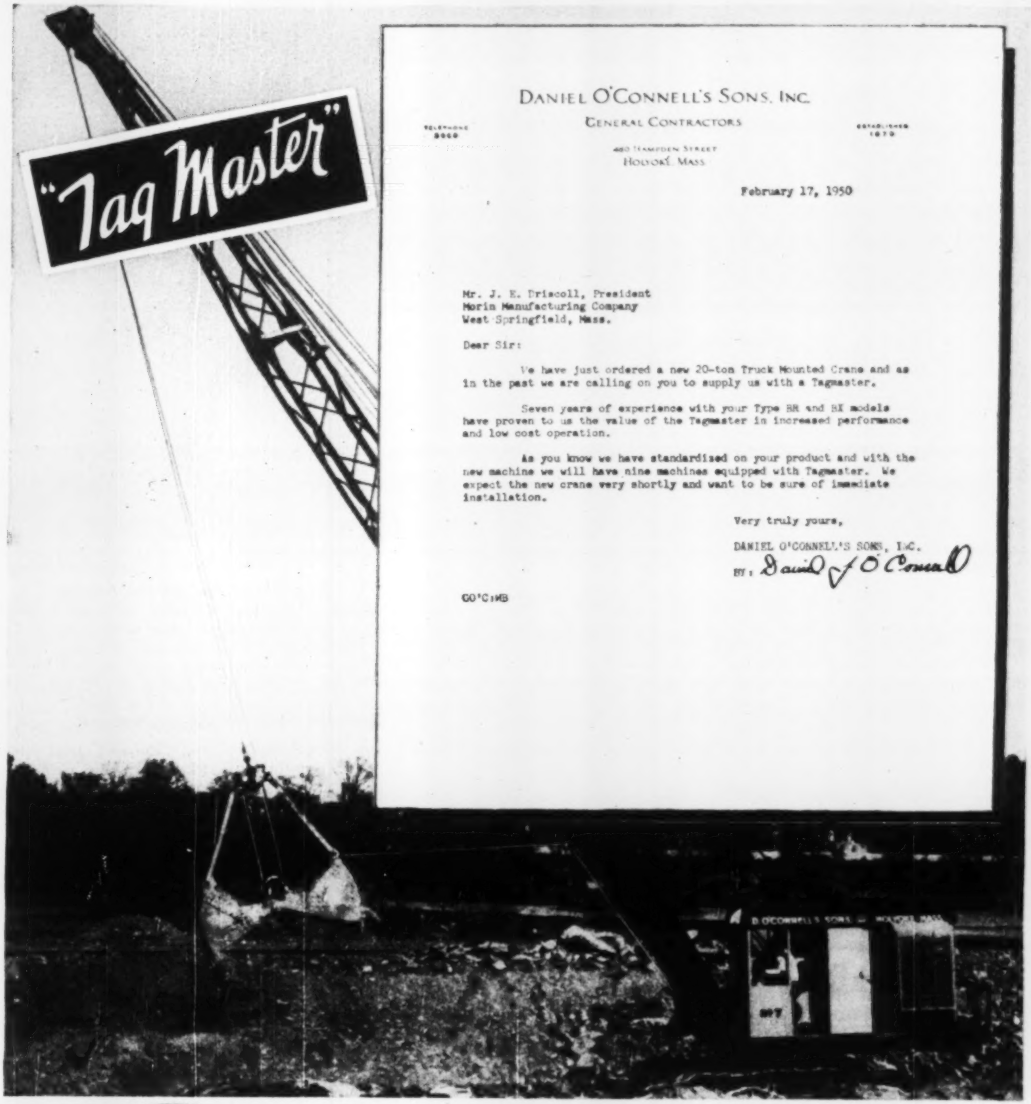
Seven-Inch Sander

Lightweight, 7-in. sander is recommended for light sanding and metal-finishing operations. It is a side-handle model with a reversible feature for right or left-handed use. Non-load spindle speed is 3,500 rpm; weight is 8 lb. It is equipped with a spindle-locking pin for quick change of attachments, and is powered by a 115 or 220-v ac dc universal motor. Other motors can be supplied.—The Black & Decker Mfg. Co., Towson 4, Md.

Non-Toxic Wood Preservative

Non-Tox wood preservative is recommended for sealing and preserving wood products. It is effective against mold, decay, mildew, and moisture, and helps prevent warpage and shrinkage. Methods of application vary although dip treatment is the simplest and most economical. Tuf-On Non-Tox contains a newly developed non-toxic solubilized copper fungicide combined with synthetic

(*Continued on page 258*)



DANIEL O'CONNELL'S SONS, INC.
GENERAL CONTRACTORS
480 HAMPDEN STREET
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February 17, 1950

Mr. J. E. Driscoll, President
Morin Manufacturing Company
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Dear Sir:

We have just ordered a new 20-ton Truck Mounted Crane and as in the past we are calling on you to supply us with a Tagmaster.

Seven years of experience with your Type BR and BX models have proven to us the value of the Tagmaster in increased performance and low cost operation.

As you know we have standardised on your product and with the new machine we will have nine machines equipped with Tagmaster. We expect the new crane very shortly and want to be sure of immediate installation.

Very truly yours,

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GO'C:MB

MORIN COMBINATION TAGLINE WINDER AND DIPPER TRIP

TAGLINE ADVANTAGES *you never had before*

1. Tagline pull is constant and *uniform* at *all* bucket *levels.*
2. Tagline pull is *adjustable* to suit job.
3. Tagline pull is *automatic.*
4. Tagline pull can be manually increased to *cast*—*twist* or *snub* a clamshell.
5. "TAG-MASTER" can also be used as a *Dipper Trip.*

Above picture taken at Holyoke Water Power Company's raceway project in Connecticut River.

Clamshell is shown pulled back by the "TAG-MASTER" as operator aimed and cast bucket *straight* out.

Write for further details

MORIN MFG. CO., West Springfield, Mass.

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switch to WARSOP
drills and breakers

It's real economy

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★ Low Operating Cost ★ Low Transportation Cost

No Battery • Positive Dual-Fan Cooling
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There's real Savings when you use Warsop Portable Rock Drills and Breakers on all types of construction and demolition work. With Warsop hard-hitting power tools you need no cables, no hose. Compact and light in weight, they are easily transported from job-to-job. Wherever you have breaking or drilling jobs that require only one or two machines figure to use WARSOP. You'll save time, labor and equipment costs.

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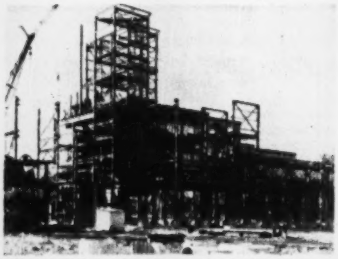

Pleasant View Mine coal tipple, West Kentucky Coal Co., Madisonville, Ky. Steel by International.

Maybe You'll Never Need A Steel Coal Tipple . . .

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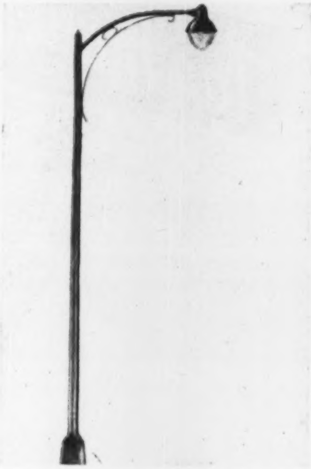
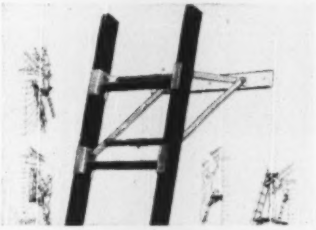
resins. It is also made in special solutions for fungus proofing and preserving canvas, rope, leather, and fiber.—Brooklyn Varnish Mfg. Co., Inc., 50 Jay St., Brooklyn 1, N. Y.



Standards for Street Lights

Tapered, octagonal lighting standards are offered in a wide variety of styles to meet any requirements. The Weldforged steel standards are built for heavy-duty use from cold-formed open-hearth steel. They feature modern design, strength combined with light weight, and clean-cut, neat appearance.—Kerrigan Iron Works, 1033 Herman St., Nashville, Tenn.



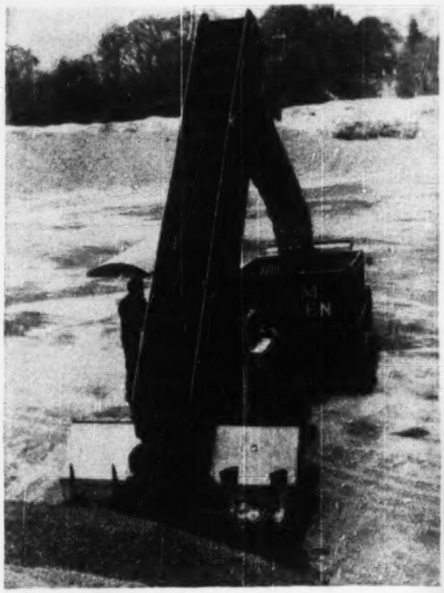
Offset Ladder Bracker

Dual-purpose offset ladder bracket can be used to hold ladder rails free of buildings or appurtenances, or, when used in pairs, as a scaffold support. New-type rail support transmits loads to the rails instead of rungs of the ladder. Rail grips are slotted to align with ladder rungs. Division bar with thumb set screw secures locking rail grips in place. Bearing plate has an extended 24-in. flange.—Steadfast Equipment Co., 57 Wheeler Ave., Pleasantville, N. Y.

Jelly Ointment for Burns

First aid jelly ointment for burns is now available in unit packaging to fit the D-Carton Interchangeable Unit System of First Aid. Americaine is a

(*Continued on page 262*)



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(Note the full Buckets)

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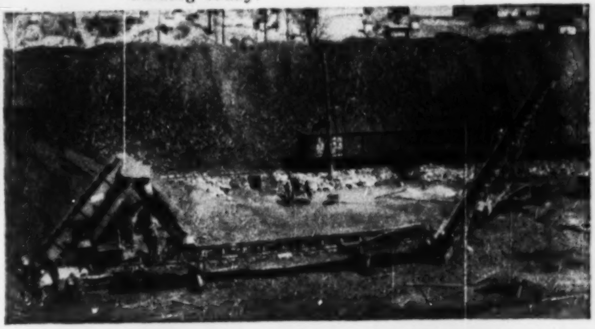
Load 3 To 8 Yards Per Minute

Haiss Bucket Loaders are used for excavating — rehandling — stripping and loading: sand — gravel — stone top-soil — coal and similar materials. Self Propelled, Self Feeding — wheel or crawler mounted — One man operation. Write for Bucket Loader Catalog today.



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portable or
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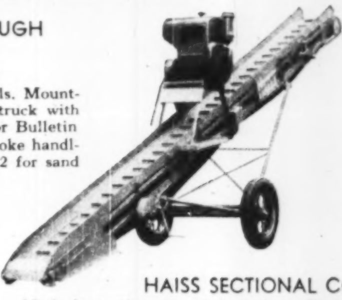
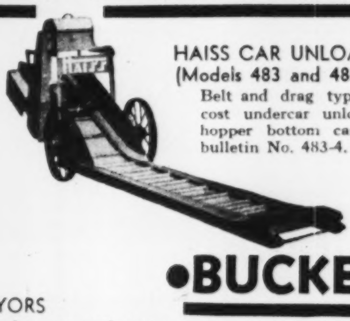
HAISS FLAT or TROUGH BELT CONVEYORS
(Model 481 and 482)
For all bulk materials. Mounted on "V" or mast truck with swivel wheels. Ask for Bulletin No. 481 for coal or coke handling—Bulletin No. 482 for sand and gravel, etc.

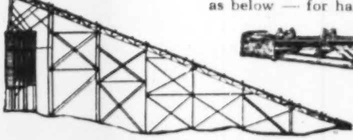


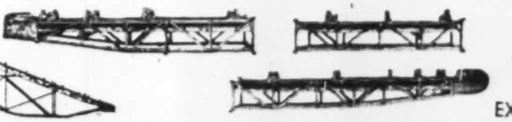


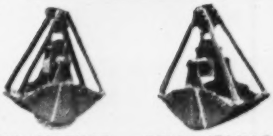
HAISS CAR UNLOADERS
(Models 483 and 484)
Belt and drag types for low-cost undercar unloading from hopper bottom cars. Ask for bulletin No. 483-4.

•BUCKETS

HAISS SECTIONAL CONVEYORS
Made in easily assembled sections. Portable as above or stationary as below — for handling all bulk materials — Ask for Bulletin 487.







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HAISS
NEW YORK, N. Y.

UNIVERSAL
CEDAR RAPIDS, IOWA.

New construction at Parklabrea—giant Los Angeles apartment project of the Metropolitan Life Insurance Company—will add eighteen 13-story apartment units, seven 2-story block-long concrete garages and several 2-story apartment structures. Completion of the new $40,000,000 section will provide 2,937 additional apartments, increasing the total number to 4,257 apartments capable of housing about 13,000 persons. Architects are Leonard Schultze and Associates, New York, represented in Los Angeles by Gordon B. Kaufman and J. E. Stanton. Starrett Bros. and Eken, Inc., New York, are general contractors.

"Amazing Results With Plywood Forms..."

on world's largest architectural concrete job!

ONCE AGAIN, forms of Douglas fir plywood provide the smooth, fin-free, easily-finished surfaces which make plywood a preferred material for such work. Close to three million square feet of these modern panels—Exterior fir plywood and plastic-faced plywood—are being used on the huge Parklabrea apartment development in Los Angeles.

Architects Leonard Schultze and Associates "consider the results amazing."

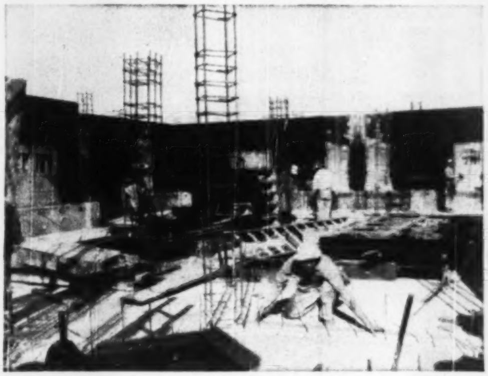
Parklabrea is another example—a *big* example—of plywood's ability to do a better form job, faster and with less labor. "The plywood produces smooth surfaces, ready for painting. Large size and light weight speed the work, and multiple form re-use reduces costs. There are far fewer joints to rub and grind."

Douglas Fir

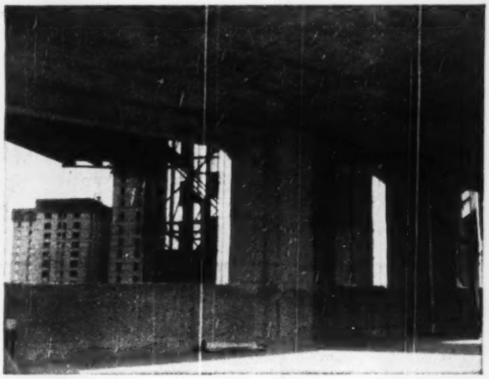
Plywood

AMERICA'S

Re-Use Another Feature; Only One Set of Plywood Forms Needed for Each Building!



Form reconstruction during pouring operations on each 13-story structure was eliminated; one set of plywood forms gave enough re-uses to complete the job! As pouring progressed, plywood forms were moved up in sections. Nearly a million square feet of plastic-faced plywood formed exterior walls and interior ceilings. Two million square feet of Exterior-type plywood was used for interior walls, foundations, stairwells.



Plastic-faced plywood formed the smooth, blemish-free surface for this ceiling—with only a paint surface needed to finish the job. Ceiling is the underside of a 7-inch thick reinforced concrete slab floor, poured against ⅝-inch panels, nailed to 2"x4" joists, 24" on center, with 4"x4" wales, 4' on center.

Large, Light, Strong
Real Wood Panels

For additional data on Douglas fir plywood for concrete form work, see Sweet's File, Architectural, or write (USA only) Douglas Fir Plywood Association, Tacoma 2, Washington. Of particular interest are two booklets: "Concrete Forms of Douglas Fir Plywood" and "Handling PlyForm."

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Concrete Form Panels

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INTERIOR TYPE GRADE B B
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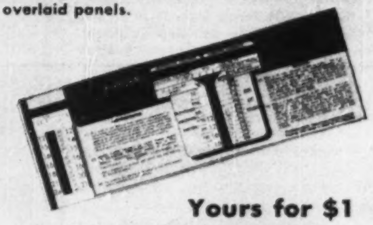

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New Keely PlyForm calculator gives construction data for plywood forms, based on hourly rate of pour. Complete with leaflet, "Design Assumptions for New Keely Calculator." Send coupon now!

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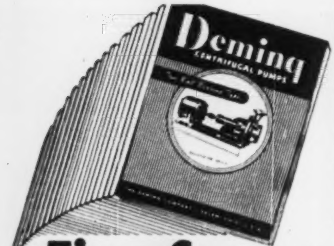

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protective dressing which will relieve pain of burns, and which is easily removed from the burn area. It can also be used for treating poison ivy, creosote burns, insect bites, and skin irritains. Principal ingredients are Benzocaine and ozyquinoline benzoate.—DAVIS EMERGENCY EQUIPMENT CO., 43 HALLECK, NEWARK, N. J.

Automotive Diesel Engines

The new 6-cylinder high-speed diesel engines are designed for on-highway and off-highway automotive applications. Both the HRBB-600 (highway) and HRBBI-600 (off-highway) models have a maximum rating of 175 hp. at 2,000 rpm. Features include: Fully counterbalanced crankshaft, camshaft of new design, viscous-type torsional vibration damper, and revised fuel pump.—CUMMINS ENGINE CO., INC., COLUMBUS, IND.

Modular-Sized Casements

Aluminum casement windows are now available in sizes based on the Modular System of Dimensional Coordination of Building Products. By adding sizes to conform to modular standards and cutting glass panes accordingly, Ualco has facilitated the use of aluminum casement windows in buildings made of brick, brick veneer, or concrete block without special cutting or shaping to form window openings.—UNION ALUMINUM CO., INC., ENGINEERING DEPT., SHEFFIELD, ALA.

Powder-Actuated Fastener

Controlled power is feature of the "300" powder-actuated fastening tool. This permits varying penetration of fastening pin for different densities of materials, and eliminates the need for various powered charges. Other features include introduction of flangeless drive pins, 5-way safety;

(Continued on page 265)

KEEP YOUR CONVEYOR BELTS GOING

FLEXCO H D RIP PLATES are used in repairing rips and patching conveyor belts. Their use saves expensive replacements and extended shutdowns.

FLEXCO H D BELT FASTENERS make a strong, tight butt joint with long life. Recessed plates embed in belt, compress belt ends and prevent ply separation. Six sizes in steel and alloys.

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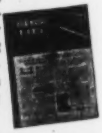

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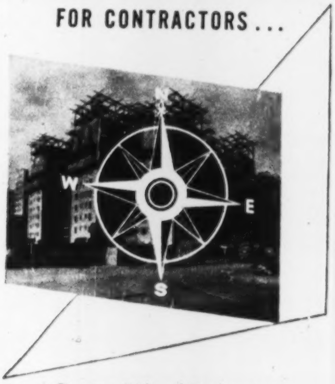

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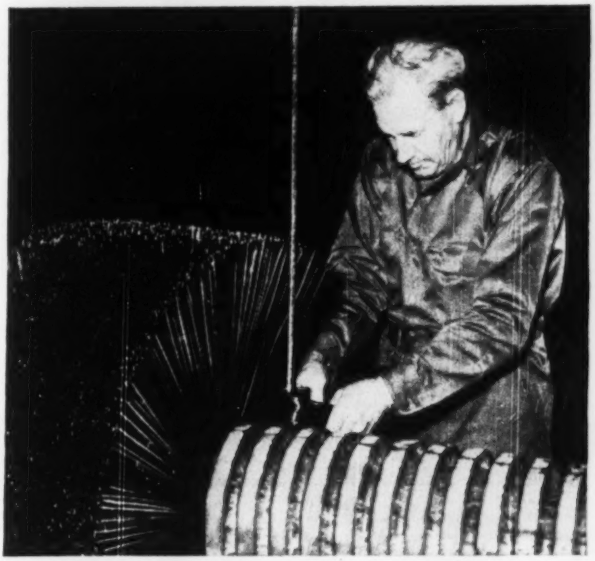

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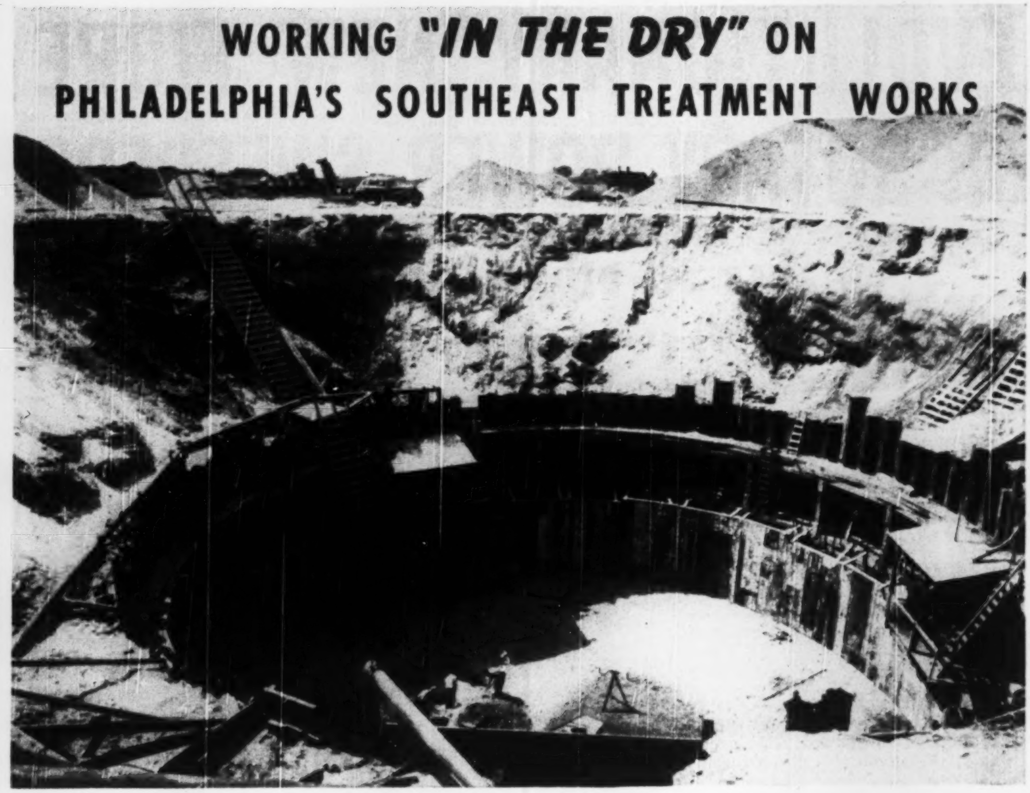

Moretrench Wellpoints control 23 feet of water on this pump station. Laminated wood whalers eliminate need for cross bracing. Contractor: Virginia Engineering Co., Inc., Newport News, Virginia.

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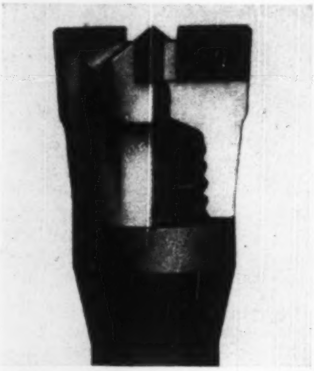
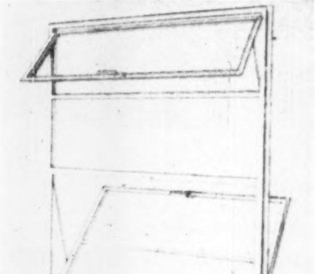


Carbide-Bit Attachment

Shoulder-type attachment was developed particularly to resist shock and impact while still preventing slippage, excessive thread wear, or loss of drilling speed. It is said to have the same long life and dependable performance of the tungsten-carbide bits. Effect of the matching 38-deg surfaces in the bit and attachment is to cushion and absorb destructive reciprocating and rotational forces that tend to ruin bit threads or to break the threaded extensions on drill rods. Four sizes are available to cover bit-gage sizes from 1⅜ to 3 in.—INGERSOLL-RAND CO., 11 BROADWAY, NEW YORK 4, N. Y.



Aluminum Window

Projected-type window features extra deep sections, welded construction and precision weathering. The Lupton Master aluminum window is designed especially for schools, hospitals,

(*Continued on next page*)

The Ninth of a Series in the interest of more efficient use of steel . . . a vital American resource

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MULTI-RIB

REINFORCING BARS

NOW . . . Available by Number in Standard Sizes of New A.S.T.M. Serial Designation A305-49 Table I

Thanks to A. S. T. M. specification A305-49, designers now have a more efficient bar for concrete reinforcement . . . one that provides **increased anchorage** which when properly used will give appreciable **savings in steel and concrete.** Advanced design Laclede Multi-Rib Reinforcing Bars exceed the A305-49 specification. They are available in uniform round sections in all standard sizes and can now be ordered by number.

TABLE I A.S.T.M. SERIAL DESIGNATION A305-49

Dimensional Requirements for Deformed Steel Bars for Concrete Reinforcement

		NOMINAL DIMENSIONS ROUND SECTIONS			REQUIREMENTS OF DEFORMATIONS		
Bar No. °	Unit Wt. Lbs./Ft.	Diameter-Inches Decimal	Cross Sectional Area Sq. Inches	Perimeter	Max. Avg. Spacing Inches	Min. Height Inches	Max. Gap, Inches ‡
3	0.376	.375	0.11	1.178	0.262	0.015	0.143
4	0.668	.500	0.20	1.571	0.350	0.020	0.191
5	1.043	.625	0.31	1.963	0.437	0.028	0.239
6	1.502	.750	0.44	2.356	0.525	0.038	0.286
7	2.044	.875	0.60	2.749	0.612	0.044	0.334
8	2.670	1.000	0.79	3.142	0.700	0.050	0.383
9*	3.400	1.128	1.00	3.544	0.790	0.056	0.431
10*	4.303	1.270	1.27	3.990	0.889	0.064	0.487
11*	5.313	1.410	1.56	4.430	0.987	0.071	0.540

*These sections have the same weight and area as bars formerly known as 1" Sq., 1⅛" Sq. and 1¼" Sq.

‡Chord of 12½% of Nom. Perimeter.

°Bar numbers are based on number of ⅛" included in the nominal diameter of the bar section.

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About specifing* LACLEDE MULTI-RIB BARS *on your jobs

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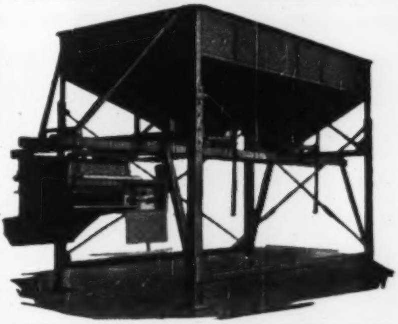
Producers of Construction Steel

LACLEDE STEEL COMPANY

St. Louis, Mo.



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—Reduces Your Job Cost

Use with a

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Complete—with scale for two or three aggregates.

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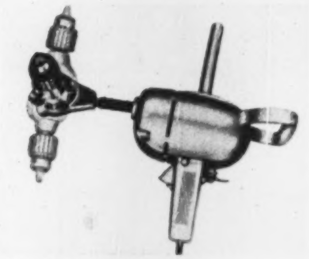
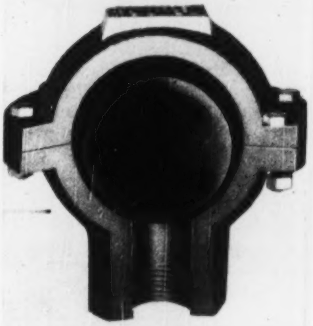
and office buildings. Windows can be glazed inside or out, and glass up to ½-in. thick can be used. All hardware is made of aluminum. Aluminum screens are available.—MICHAEL FLYNN MFG. CO., 700 E. GODFREY AVE., PHILADELPHIA 20, PA.



All-Angle Head Drill

Angle-head attachment for ½-in. drills is designed for use in hard-to-get-at tight spots. It will fit any ½-in. drill with Model 33B Jacobs chuck. Gearing has a 2:1 ratio; no-load spindle speed on right angle head is 275 rpm; and the unit weighs 2 lb. With the drill set at right angles, the tool measures 7½ in. wide.—CUMMINS PORTABLE TOOLS, 4740 RAVENSWOOD AVE., CHICAGO 40, ILL.



Pipe-Line Shock Absorber

These liquid shock absorbers are designed to eliminate shock and hammering in pipe lines and liquid systems. They are available in five models, and have no moving metal parts. A rubber cushion, encased in a spherical metal chamber, absorbs the shock. This cushion pulsates constantly according to the increase or decrease of pressure in the system. Can be installed in any position. — R-S PRODUCTS CORP., WAYNE JUNCTION, PHILADELPHIA 44, PA.

Fire Coating for Steel Beams

Fireproofing cement is said to prevent steel beams from collapsing in the event of fire. When applied in a

(*Continued on page 270*)

GOOD BUSINESS BEGINS AT HOME!

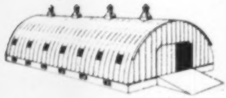
Reynolds great new Aluminum Cable mill at Listerhill, Ala., showing roofing and siding of Reynolds *Lifetime* Aluminum Industrial Corrugated.

Begin your Building Plans with Permanent, Maintenance-free

REYNOLDS *Lifetime* ALUMINUM INDUSTRIAL CORRUGATED

It's good business to *start* your building plans with this superior roofing and siding, because aluminum's light weight can effect substantial savings on your framing structure. And your savings go right on. You'll have rustproof permanence... no need for protective painting... no regular maintenance expense. Your buildings will be cooler in summer, warmer in winter... because aluminum reflects up to 95% of radiant heat. You'll have more light inside if you leave the bright aluminum exposed.

You can have these advantages at actually *less total installed cost* per square than for other common roofing and siding materials... mail coupon for proof! This Industrial Corrugated is .032" thick, with extra deep corrugations for greater strength. Easy to apply over any type of purlin. *Reynolds can furnish Nelson Composite Rivweld Studs* that save up to 50% on application cost. Or strap or wire stock as desired. For technical assistance on specific problems, call any Reynolds office, in 32 principal cities, or write to **REYNOLDS METALS COMPANY**, Building Products Section, Louisville 1, Kentucky.



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All aluminum. Patented all-bolt construction. Basic unit 36' x 60', length variable by 6' sections.

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Please send full information *including cost comparison* on Reynolds *Lifetime* Aluminum Industrial Corrugated.

Also details of Reynolds Alumi-Drome.

Firm Name____________________

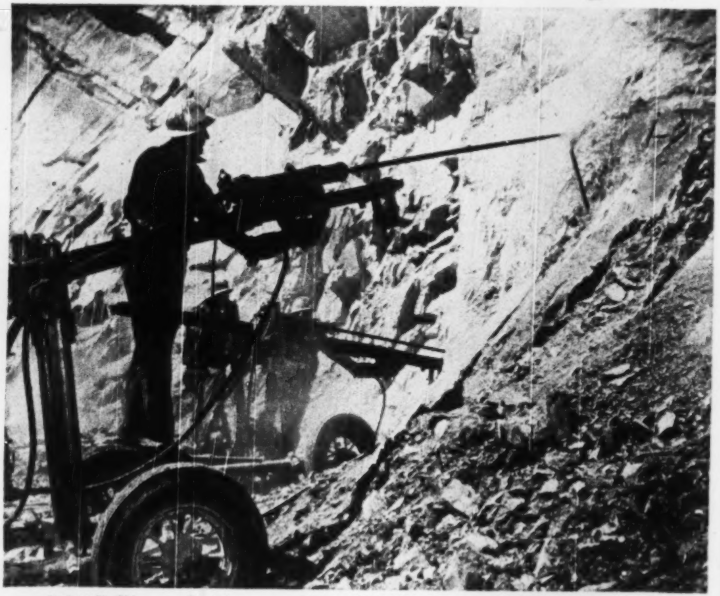
Name____________________

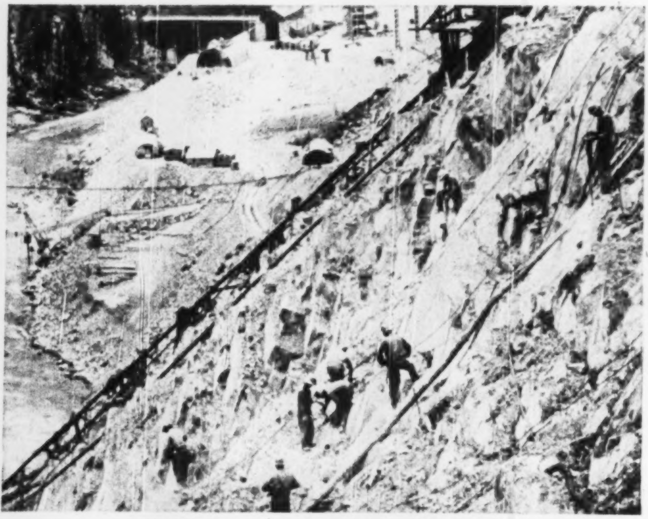
Address____________________

REYNOLDS ALUMINUM

CP at Hungry

CP rock drills at Hungry Horse


G-200R Wagon Drills, mounting 4" drifters, run 24-foot blast holes.

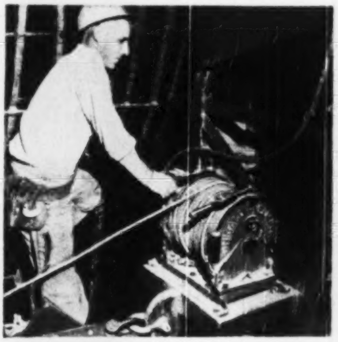

CP-42 sinker drills are used on the keyway.

A battery of CP-55 Diamond Drills is employed for blast hole drilling in the spillway tunnel — 955 feet through solid rock. CP-55 Diamond Drills are also used for blast hole drilling of the keyway area.

Horse

HUNGRY HORSE DAM—

gigantic irrigation and hydroelectric project is being built with CP equipment



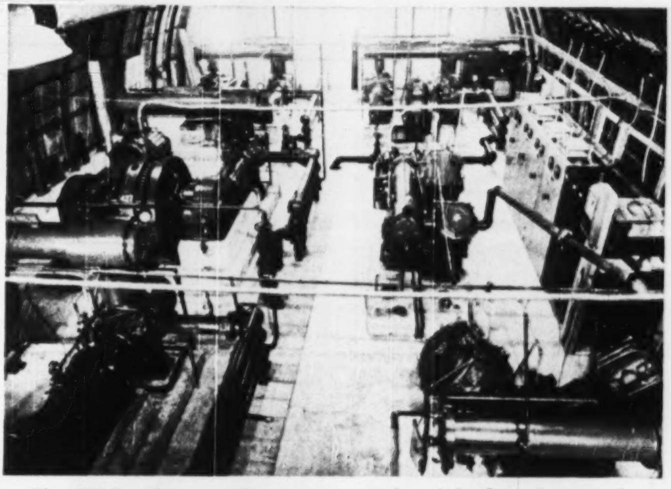
CP Pneumatic Winch

To maintain work on a 24-hour basis, one hundred sixty 1500-watt flood lights, in two series, are stretched across the 2100-foot canyon, on an endless cable. This is powered by a CP Pneumatic Winch so the lights can be pulled in for re-lamping.

CP Pneumatic and Hicycle Electric Vibrators

CP Vibrators, of both electric and pneumatic types, will be used to place the nearly three million cubic yards of concrete.

Batteries of CP Wagon Drills and Diamond Drills . . . CP Sinker Drills in gangs . . . a building full of CP Stationary Compressors . . . CP Portable Compressors in mobile service . . . CP Pneumatic and Electric Vibrators . . . and CP Pneumatic Tools are working around the clock.



Six CP Stationary Compressors furnish the air supply

The main air supply is provided by a stationary compressor plant, where four Type O-CE Compressors and two Type Y Compressors furnish 7010 cfm. of air at 100 p.s.i.

In addition, there are six CP Portable Compressors—five of 500 cfm. capacity and one of 105 cfm.—used for mobile operations.

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General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
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Now! You Get the BIG SAVINGS from Fast, Economical Air Placement of Concrete . . . with the New BONDACTOR!

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Saves Time, Labor, Money... Increases Profits on

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- Repair of disintegrated concrete, brick, stone, other masonry
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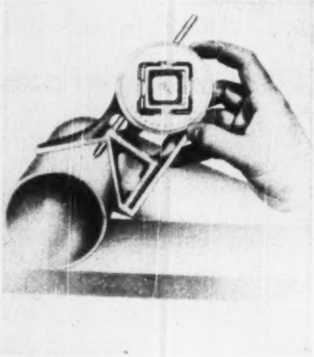
1¾-in.-thick coating, the cement is said to retard the effect of a great heat for three hours. It is sold as a gray, powdered material which is mixed with water to form a stiff paste, and then troweled onto ribbed metal lath wrapped around the steelwork to be protected. The material resists spalling and crumbling, even under high-pressure fire-hose streams if an outer coating of harder material is applied as recommended. A special feature of the material is its light weight.—EAGLE-PICHER CO., AMERICAN BLDG., CINCINNATI 1, OHIO.



Center Finder for Round Pipe

Compact tool accurately locates the center of circular pipes. The Model PF has a revolving dial with four levels marked in both degrees an inches per foot. It weighs 6 ounces, and measure 6 x 4 x 1¼ in. The center punch has a hardened point and will punch milled steel. The frame is a magnesium casting; all other parts are brass or stainless steel.—INTERSTATE SALES CO., 123 E. 18TH ST., NEW YORK 3, N. Y.

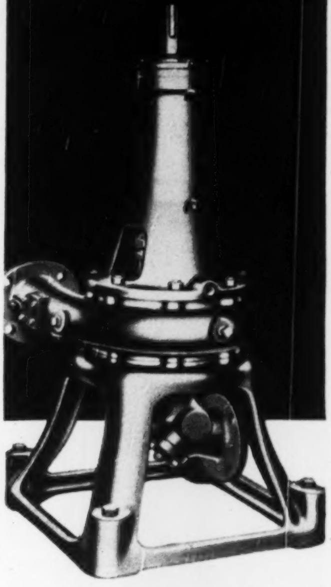
Grease-Fitting Cleaner

Pocket-size tool is designed to remove mud, ice, or other foreign matter from grease fittings. The Muskegg tool consists of four special-shaped steel blades set in a spring-loaded shaft in a molded plastic-ribbed handle. The blades easily snap on any standard fitting under spring tension which grips them firmly around the fitting. A quarter twist of the tool completely frees the fitting of all accumulated matter.—DOVER-PRAIRIE CORP., 22 N. LAGRANGE ROAD, LAGRANGE, ILL.

Chain-Breaking Vise

The Morse steel-jaw chain-breaking vise accommodates all American Standard sizes of roller chain from ¼ to 2½-in. pitch, single, and multiple widths. Although changes for the

(Continued on page 272)



It's up to 25 times more "Non-Clog"!

Here . . . now . . . is an amazing development in sewage and trash pumps . . . the Fairbanks-Morse *Bladeless* Impeller Pump.

In actual tests and field operation, it is from 10 to 25 times more "non-clog" than any conventional sewage and trash pump.

Another important advantage is the fact that for a specific solids size, the pump delivers approximately one-half the capacity of conventional sewage pumps. Thus you do not flood filter beds in plants where sewage flows are relatively low. Reduced capacity permits the use of smaller driving motors, thus assuring economical costs . . . lower power costs.

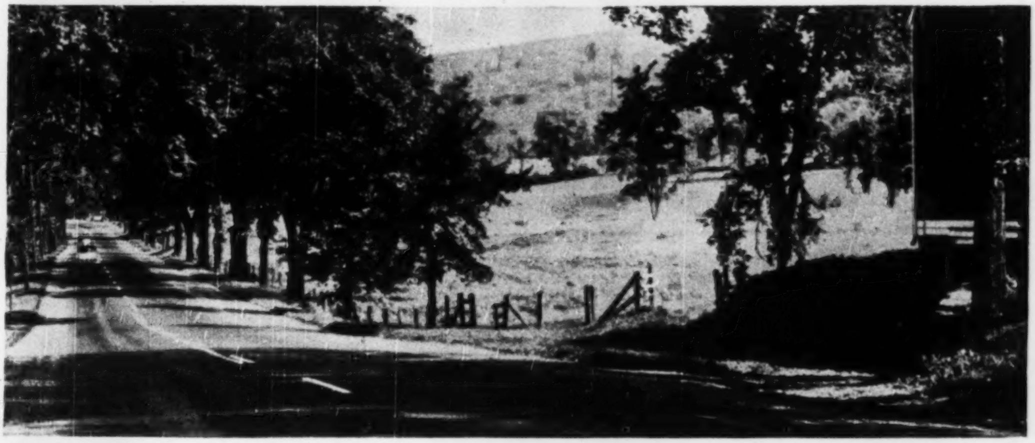
For complete details, check your Fairbanks-Morse Pump Distributor, local branch office, or write Fairbanks, Morse & Co., Chicago 5, Ill.

Eliminating blades, this impeller is a helical channel . . . a "whirling tube" with no blades to catch and hold fibrous trash and cause the pump to clog.

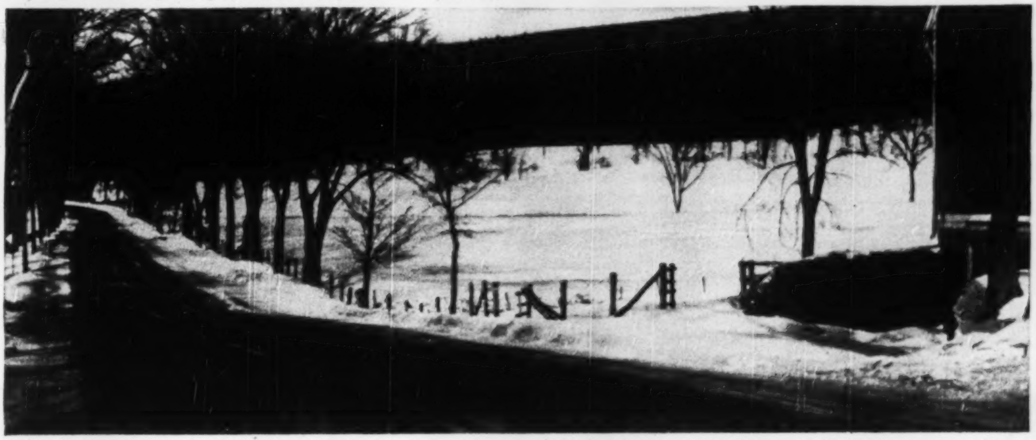
FAIRBANKS-MORSE,
a name worth remembering

Diesel Locomotives and Engines • Electrical Machinery Pumps • Scales • Home Water Service and Heating Equipment • Rail Cars • Farm Machinery

STANDS UP UNDER SUN OR FROST!



Under summer sun, roads built with Tarvia* road tar are non-glare and blend with every landscape. Moreover, they are self-healing under compacting traffic, and they will not wave, roll, push, or bleed. In addition, Tarvia* road tar roads are always easy on the eyes, and always easy to ride on.



When frost and snow comes, roads built with Tarvia road tar are easier to keep open. That's because their black surface absorbs heat—causing snow and ice to melt more readily. In addition, Tarvia road tar is not affected by either calcium chloride or sodium chloride.

Barrett's 46 years of experience in road building, maintenance and repair is yours for the asking. *Ask the Barrett field man.*

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Thanks to their slightly granular, "tractionized" surface, roads built with Tarvia road tar give tires a firm tread hold.

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ROAD TAR

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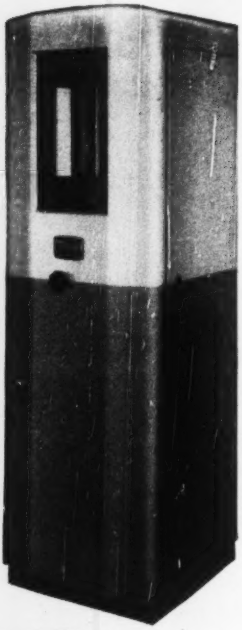

SUPER-SAFE!

Builders Chlorinizers set a new high in safe operation. Their safety features go into action automatically and positively. The chlorine control valve with many hundreds of pounds seating pressure instantly shuts off flow of chlorine gas if ANY condition occurs to interfere with SAFE operation of the Chlorinizer: loss of vacuum, breakage of glass parts, water failure, or injector stoppage. Additional safeguards prevent troublesome seepage or escape of chlorine into the room.

Chlorination with Builders Chlorinizers is truly super-safe . . . and super-simple, as well. Your regular plant personnel can easily handle the operation and servicing of these modern feeders. Chlorinizers are readily adapted to semi-automatic, program, or automatic proportional systems. For engineering information and descriptive Bulletins, address Builders-Providence, Inc. (Division of Builders Iron Foundry), Providence 1, R. I.

BUILDERS Chlorinizers

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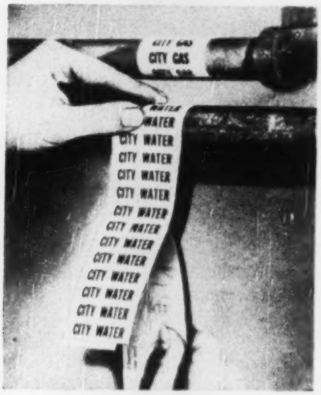
Use this Class "E" Clam Shell Bucket for handling crushed stone, gravel, sand and other bulk materials.
THE HAYWARD CO., 48-50 Church St., N. Y.

accommodation of different sizes may be made instantly, settings are accurately maintained until readjusted. Precision construction and heat-treated alloy-steel jaws assure long life at maximum efficiency.—Morris Chain Co., Div. Borg-Warner Corp., 7601 Central Ave., Detroit 8, Mich.



Self-Sticking Pipe Markers

Pipes from $\frac{1}{4}$ to 2-in. in diameter can be quickly identified by using preprinted self-sticking Quick-Label pipe markers. Each of the markers comes mounted on its own card, making it handy for carrying in tool kits and pockets. The strips are 9 in. long, and are printed in bold, legible type. Quik-Labels are also available with lettering running horizontally for use on large-diameter pipes.—W. H. Brady Co., Dept. 181, 815 N. 3rd St., Milwaukee, Wis.

Tube-Flaring Tool

Rol-Air tool flares and burnishes copper, brass, or aluminum tubing for making tight, strong, flared joints. It has three rollers embodied in the spreader cone so that flare is rolled out with the tubing extended above the face of the flaring block, maintaining original wall thickness. Tool can be used with $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{1}{2}$ and $\frac{5}{8}$-in. (OD) tubing.—The Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7, Ill.

Tool for Rubber-Lined Pipe

Preparation of flexible hard-rubber-lined pipe is simplified by use of the Gaco pipe tool. Designed for use with the Gaco pipe-joint system, the tool will cut to length, face, groove, and counterbore without any other special equipment. The tool has collets for $1\frac{1}{2}$, 2, $2\frac{1}{2}$, 3, and 4-in. pipe diameters. It can be used with any piece of equipment that will rotate pipe, such as a pipe threading machine or lathe.—Gates Engineering Co., P. O. Box 1711, Wilmington, Del.

YOU CAN'T DO THIS with any other single unit!

What the Direct Pour will do!

- Places concrete 23 ft. up with a standard 35 ft. boom. Greater heights with longer booms.
- Loads open truck bodies.
- Feeds Pumpcrete.
- Feeds hoppers or concrete buggies.
- Will travel along and pour direct to forms.
- Travel and pour series of basement foundations and / or wall.
- Travel between forms and pour footings.
- Pour walls in low headroom where crane can't work.
- Pour floor or highway.

What the Direct Pour Saves!

- Eliminates crane and concrete bucket.
- Eliminates mixer.
- Eliminates chuting tower or other elevating equipment.
- Reduces ramps and false work required.
- Reduces ground crew.
- Reduces concrete haul for buggy men.
- Reduces time always lost in transferring concrete from one piece of equipment to another.

PLAN your job for the MultiFoote with the HighLift Boom. Built in three capacities from single to double drum it brings you high output, gives you better control of your concrete delivery and will place concrete 23 ft. up with a standard boom (greater heights with longer booms).

Crawler traction permits easy travel over the ordinary rough ground conditions of a construction job and will not dig itself in as do wheels. Bucket controls are at the bucket where they should be to handle exact placement to hoppers or spouts. MultiFoote Simplicity makes maintenance easy and keeps costs low. Check this column at the right and see what you eliminate for cost cutting and note what the MultiFoote and the HighLift Boom make possible. More information on how it will help you if you will ask us.

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Subsidiary of Blaw-Knox Co.
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MULTIFOOTE PAVER
FOR EVERY PLACE CONCRETE MUST BE POURED

A BLAW-KNOX PRODUCT

DO YOU LAY BLACKTOP?

The Adnun does a better job particularly with cold mixes. Its sturdy structure eliminates rebuilding periodically and its flexibility permits laying any type of aggregate. Ask for complete details.

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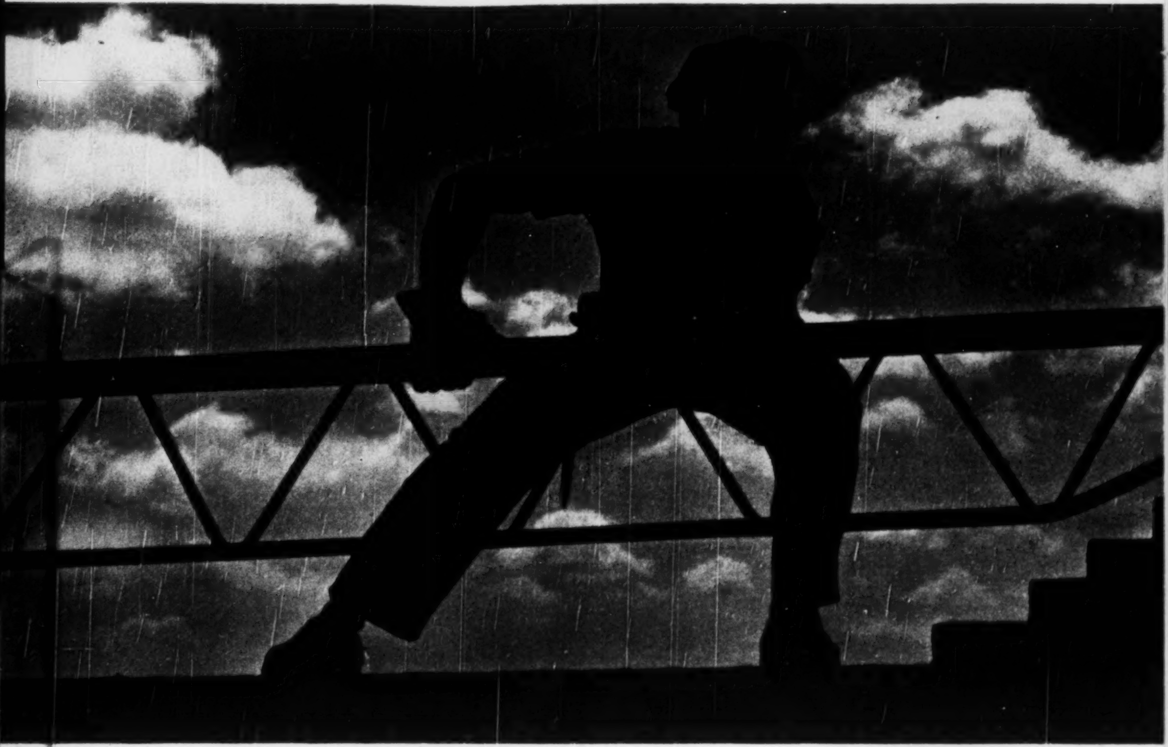


When *Speed* is the Need...Use CECO

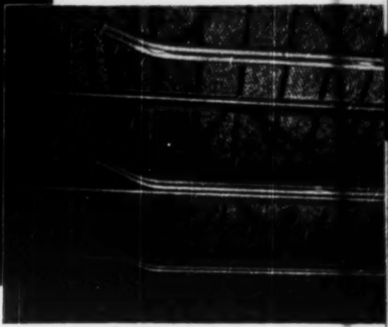
One day you pass a new development in the making, ground is broken, home foundations are in. Then, in just a short, short time, where once there was open countryside, a whole community, spick-and-span new, "has sprung up overnight." Chances are the stores, the school, the theatre . . . yes, most of the light occupancy buildings . . . were constructed with Open-Web Steel Joists. For that is the fastest way ever to build. There's no temporary formwork necessary . . . nothing to take down later on. Open-Web Steel Joists are self-centering . . . are placed on the wall structure and right away rib lath can be laid and concrete poured to form the floor. And while all this is going on, other building

CECO STEEL®

In construction products **CECO ENGINEERING**

a *Community* Tomorrow

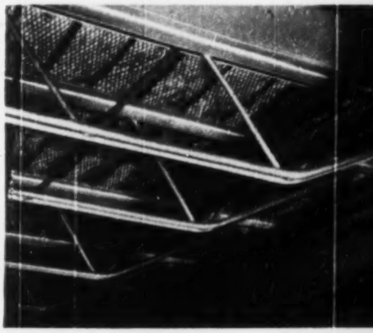
Economical — Ceco Open-Web Steel Joists are self-centering. The form work for the concrete slab—usually metal rib lath or steeltex—rests directly on the steel joists without other support from the underside.



Open-Web Steel Joists

trades can be on the job doing their special work such as installing steel windows, electric wiring, plumbing and heating. So, when speed gets the call, specify CECO OPEN-WEB STEEL JOISTS. They are fabricated to exact size in the factory, come to the job tagged, ready to install... provide low cost fire resistive buildings. Ceco assures you fast service from five plants: Birmingham, Chicago, Houston, New York and Wheeling, W. Va.

Conceals Conduits — Ceco Open-Web Steel Joists provide a ready means of concealing ducts, wiring and piping. Space is saved by direct attachment of ceilings to joists. Time and materials are saved, too.



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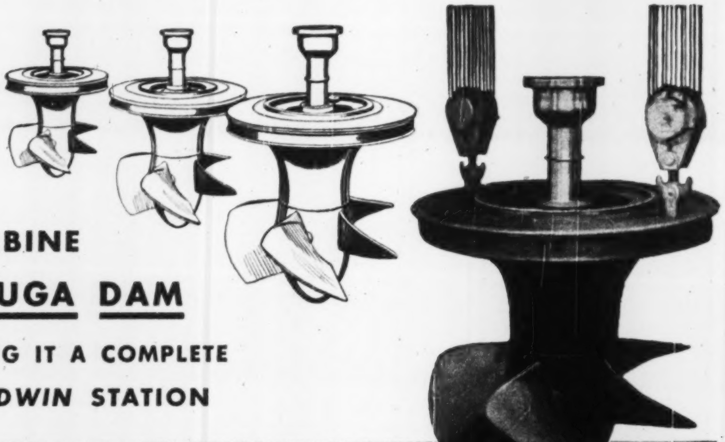
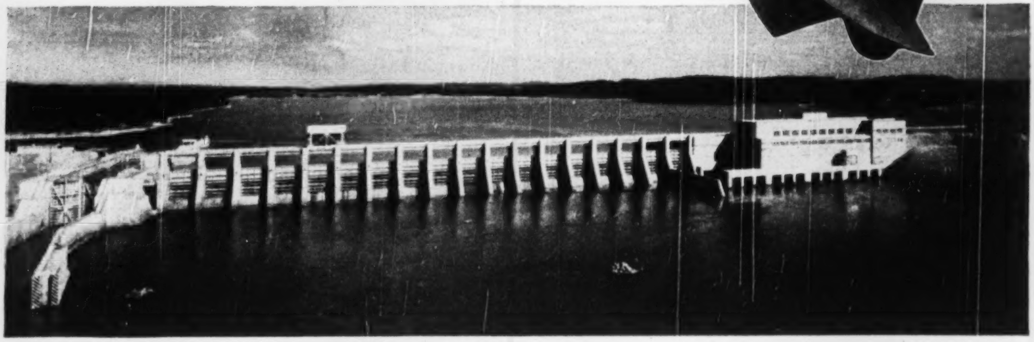


THE FOURTH TURBINE FOR CHICKAMAUGA DAM

MAKING IT A COMPLETE *BALDWIN* STATION



An increase of 33-1/3% in capacity has been effected at Chickamauga Dam. A new Baldwin turbine rerecently installed completes the installation contemplated in the original design; the first three Baldwin turbines having been installed in 1937.

The new turbine is the adjustable-blade type, and will deliver 42,000 hp. at 75 rpm. under a normal head of 48 feet. It is designed to develop at least 20,000 hp. under a 25-foot head, and 36,000 hp. with a 36-foot head. This maximum utilization of reduced heads is of course possible because of the automatic positioning of the blades to suit each condition. Runner diameter is 22 feet, and total assembled weight is approximately 800 tons. When operating at full load, the turbine will discharge up to 8,750 cubic feet of water per second

A total of twenty-seven Baldwin turbines have been built, or are on order, for various TVA projects. Types include Francis, fixed-blade, propeller, and adjustable blade propeller types, in capacities from 30,000 to 53,000 hp. Baldwin's broad experience is available to you, in working out details on any development you have in prospect.

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The Baldwin Locomotive Works, Philadelphia 42, Pa., U. S. A. Offices: New York, Houston, St. Louis, Chicago, Cleveland, Pittsburgh, San Francisco, Washington. In Canada: Baldwin Locomotive Works of Canada, Ltd., Toronto, Ontario.

Manufacturers' Publications

Parsons Trenchliner — Model 250 Trenchliner is described in 8-p bulletin. This bulletin features photographs depicting exclusive Trenchliner features, and schematic drawings listing detailed dimensions of the machine. The 250 has a range of 30 digging feeds permitting excavating from 1½ to 3½ cu yd per min. It will dig a trench 16 to 42 in. wide and 12½-ft deep. The machine has 3 forward traction speeds and one reverse, and a 3-bucket line and conveyor belt speeds. — PARSONS CO., KOEHRING SUBS., NEWTON, IOWA.

Prestressed Concrete—A report on the Walnut Lane bridge in Philadelphia (the first major structure in the United States to be built of prestressed concrete) has been prepared as a 4-p bulletin. This bulletin stresses the use of Plastiment, a concrete densifier and retarder, in the construction of the bridge. The bulletin describes the project in general, and contains specific information on a sample girder tested Oct. 25, 1949.—SIKA CHEMICAL CORP., 35 GREGORY AVE., PASSAIC, N. J.

Truck-Mounted Shovel Cranes—Applications, construction details advantages, and specifications of the HC-51 truck-mounted shovel crane are listed in Catalog 2322. Features described include the Speed-o-Matic hydraulic controls, front-drum reversing mechanism for power-control load lowering, and heavy-duty carrier specifically designed for truck-crane operation. The HC-51 is convertible to all conventional front-end attachments, has a travel speed of 37 mph, and walking beam support on rear axles.—LINK-BELT SPEEDER CORP., CEDAR RAPIDS, IOWA.

Suspended-Ceiling Construction—Nailock method of suspended-ceiling construction is described and illustrated in the 1950 edition of Nailock Catalog N-2. The catalog also describes recent developments in installing ceilings with or without acoustical materials. These developments include a new special Zipper Splice Lock Clip which holds adjoining ends of Nailock nailing channels in a rigid position and prevents bulges or depressions in the ceiling surface; and the Metal End Lock Strip which holds adjoining sheets of backerboards securely in place. — NAILOCK STEEL DIV., THE SANYMETAL PRODUCTS CO., INC., 1705 URBANA ROAD, CLEVELAND 12, OHIO.

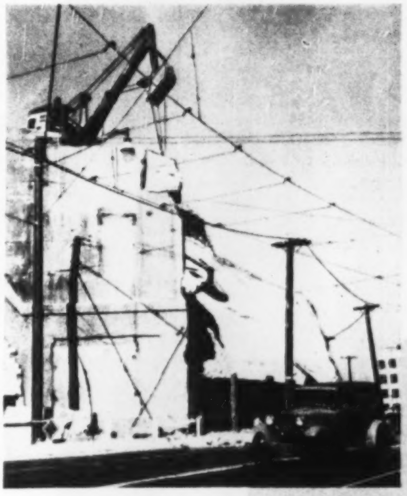
When the man says **NO BLASTING**

use a *Duncan* HYDRAULIC

ROC-JAK®!

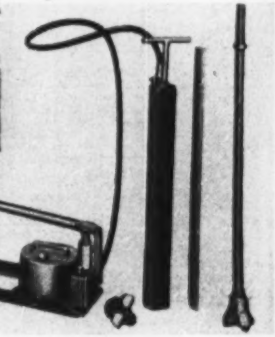
FOR HEAVY CONCRETE DEMOLITION

The Duncan Roc-Jak performs a quick, economical job in the demolition of mass concrete or cemented brick, where the use of explosives or ball drop is prohibited or impractical. The Jak—rugged and of simple operation will function in any position. Noiseless, dustless and safe.



Demolition of Los Angeles tunnel portal with one Roc-Jak. Total drilling and breaking time of 10 ton piece shown — 14 minutes. Guy F. Atkinson Co., Contractors.

Type 10 Duncan Hydraulic Roc-Jak — weight 94 lbs. Develops 150 ton thrust pressure in 3 minutes.



- Breaker body 24" long — 3" diameter.
- Ten machined piston openings — precision ground & heat treated.
- Made of the toughest and finest steel.
- Ten 1⅝" hardened, alloy steel pistons with neoprene cups.
- 30" steel shim or feather.
- Hydraulic pump — 6' of high pressure hose — capacity 15,000 P.S.I.
- Six 3½" detachable drill bits.
- Drill rod — 27" under collar — steel size optional.
- Weight of complete unit approximately 94 lbs.

Write for bulletin and price

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PROPOSED PROJECTS

WATER SUPPLY

Conn., Norwalk—City, 2nd Taxing Dist., Norwalk, reservoir, enlarging storage facilities, incl. higher dam and dike, rein.-con. intake and concrete cone wall, earth and concrete dam, Wilton Reservoir, $100,000. Buck Seifert & Jost, 112 E. 19 St., New York, N. Y., consult. engrs.

Ia., Denison—City, City Hall, WW. sys. exten. $732,-033, C. A. Haskins Eng. Co., Finance Bldg., Kansas City Mo, consult. engr. CD 3/12/46.

Ky., La Grange—City, water filtration plant and pump. station, $150,000. Howard K. Bell, 553 S. Limestone St., Lexington, consult. engr.

Md., Bowie—State Dpt. Pub. Impvts., 506 Park Ave., Baltimore, water and sewer lines, water treatment plant, Bowie State Teachers College, incl. 100,000 gal. steel tank, $150,000. Sandlass-Wieman & Assoc., 1021 N. Calvert St., Baltimore, engrs., John B. Funk, ch. engr.

Miss., Waynesboro—Town, c/o Mayor, voted $175,000 bonds Nov. 8, WW. and sanitary sewer imprvs., Mallett & Assoc., 416½ E. Amite St., Jackson, engrs. CD 10/25.

Tenn., Milan—Town, water and sewer expansion, $135,000.

Tex., Carrizo Springs—City, voted bonds, WW. $225,000. The Marvin Turner Engineers, Nalle Bldg. Annex, Austin, consult. engrs.

Tex., Deer Park—City, voted bonds, water lines and sys. rehabilitation, supply, $90,000; storage steel tank and tower, $60,000. Garrett Eng. Co., 5008 Almeda Rd., Houston, consult. engrs. CD 2/6.

Tex., Kingsville—City, bond election April 11, 500,000 gal. elevated steel storage tank and tower, $75,000; 36,000 lin. ft. 6 and 8 in. c.i. water lines, supply well, manholes, $150,000.

Tex., San Antonio—City Water Bd., 106 W. Market St., 12 in. feeder main in north sect. of city, $65,000; 16 in. feeder main in northeast sect. of city, $75,000; addnl. artesian water supply well, northeast sect. of city, $30,000 addnl. artesian water supply well, north sect. of city, $30,000. W. D. Masterson, c/o owner, engr. CD 1/19.

Utah, Tremonton—Town, c/o Clerk, 400,000 gal. rein.-con. reservoir. Win Templeton, Dooly Bldg., Salt Lake City, consult. engr. CD 2/17.

Wis., Blooming Grove—Town of Blooming Grove, 3398 Monona Dr., Madison, water supply sys. $250,000. General Eng. Co., Portage, consult. engr.

Wis., Plainfield—Village, WW sys. sewerage sys., and sewage treatment plant. $135,000. General Eng. Co., Portage, consult. engr.

Wyo., Evanston—City, pipe line and filter plant, $500,-000. G. H. Champman, Evanston, city engr. CD 1/22/47.

Alaska, Kodiak—City, City Hall, Kodiak, water sys. $195,534. Hubbell & Waller Eng. Corp., 216 Ward St., Seattle, Wash., consult. engrs.

SEWERS, WASTE DISPOSAL

Calif., Los Angeles—Bd. Supervs. Los Angeles Co., 501 Hall of Records, sewers 29,510 ft. Whitmore St., C.I. 1243, $128,000; 32,170 ft. Fern Ave., C.I. 1269, $154,400; 33,900 ft. Layton St., C.I. 1255, $152,500; 38,160 ft. El Molino Ave., C.I. 1258, $163,000; 31,200 ft. Woodbury Rd., C.I. 1270, $140,000; 24,600 ft. Mariposa St., C.I. 1271, $110,-000, all foregoing Altadena; 11,770 ft. Wedgewood Ave., C.I. 1262, $53,400; 13,400 ft. Garibaldi Ave., C.I. 1277, $64,800; 22,160 ft. Primrose Ave., C.I. 1318, $104,800; 21,000 ft. Baldwin Ave., C.I. 1321, $103,400; 14,020 ft. Kaufman Ave., C.I. 1332, $64,000, all foregoing Temple City; 14,000 ft. Grape St., C.I. 1244, Montebello, $91,000; 6,850 ft. 173 St., C.I. 1278, Lawndale, $53,700; 17,470 ft. Mooney Dr., C.I. 1279, South Garvey, $121,900; 12,320 ft. Meeker Ave., C.I. 1283 El Monte, $60,900; 13,470 ft. Herald Ave., C.I. 1320, Lancaster, $68,-100. C. E. Arnold, co. engr.

▲ **Calif., Norwalk**—Los Angeles County Sanitation Dist. 18, voted $4,600,000 bonds, main line sewers. A. M. Rawn, dist. engr.

▲ **Conn., Ansonia-Derby-Shelton**—Tri-Cities Sewage Disposal Plant Comn., R. V. Tippet, ch., 356 Main St., Ansonia, considering joint sewage disposal plant trunk sewers, etc. $2,000,000-$3,000,000. V. B. Clark, Main St., Ansonia, engr. This is an alternate to individual plant 8/3/45 under Ansonia, 7/12/44 under Shelton and 9/24/45 under Derby.

Idaho, Nampa—City, City Hall, trunk sewer to serve area west and south of present sewer limits, $222,-932. R. J. Briggs, 619 Grove St., Boise, consult. engr.

Ia., Shenandoah—City, City Hall, storm sewers, $125,-000. Henningson Eng. Co., Standard Oil Bldg., Omaha, Neb., engr.

Kan., Ottawa—City, City Hall, $165,000 bond election Apr. 4, sewage plant imprvs.

La., Covington—State Div. Admin., Capitol Annex, Baton Rouge, Feb. 28, Pur. Req. 21,651, Prop. 1, sewage collection, water and gas distr., from Sullivan, Long & Hagerty, Bessemer, Ala. $55,596; Prop. 2, pump. station and sewage treatment plant, from Union Constr. Co., 2634 Almonaster Ave., New Orleans, $81,622, above work for Southeast Louisiana State Hospital, St. Tammanys Parish, CD 2/18.

▲ **Md., Baltimore**—City, Bureau Sewers, 312 Municipal Bldg., brick, steel sludge reduction plant, incl. installation drying equip., $1,000,000, Whitman, Requardt & Assoc., 1304 St. Paul St., engrs., John J. Hunt, 312 Municipal Bldg., sewerage engr. CD 1/12/45.

Md., Towson—Comrs. Baltimore Co. Court house, Towson, 1 story, brick, pump. station, 8- to 12-in. terra cotta sanitary sewers, White Marsh, $250,000; 8- to 12-in. vitr. clay sewers, 15- to 48-in. concrete drains, 8- to 12-in. c.i. water lines, Villanova Sect., $200,000, Sandlass, Wieman & Assoc., 1021 N. Calvert St., Baltimore, Zone 2, engrs., Wm. F. Neale, Court House, ch. engr. CD 1/26/44, under Water Supply.

Mass., Turners Falls—Town, W. C. Wentworth, chn. Sewage Disposal Comn., Turners Falls, 2 sewage disposal plants, facilities, $200,000. Camp, Dresser & McKee, 6 Beacon St., Boston, consult. engrs.

Mich., Saugatuck—Village, Village Hall, sewage treatment works, and sewerage sys. $300,000. Consoer Townsend & Assoc., 351 E. Ohio St., Chicago 11, Ill., consult. engrs.

Minn., Lauderdale—Village, G. Gunderson, clk., sanitary sewerage sys. $100,000. E. G. Briggs, 2360 University Ave., St. Paul, consult. engr.

Mo., Berkeley City—(St. Louis 21, P. O.)—City, Edw. A. Walsh, mayor, City Hall, Airport Rd. and Helen Ave., cancelled $613,000 bond election to have been held Apr. 4, trunk and lateral sewers, 2 disposal plants with auxiliaries, appurtenances, Russell & Axon, 408 Olive St., St. Louis, Zone 2, engrs. CD 2/10.

N. M., Santa Fe—City, City Hall, sewerage sys. $600,-000. Herkenhoff & Turney, 223 Montezuma St., engrs. and archts.

Okla., Ada—City, bond election Apr. 4, sewage disposal plant, trunk sewers, $920,593. Ralph Delaney, P. O. Box 411, consult. engr. CD 1/12.

Ore., Hermiston—City, City Hall, voted bonds, sewage treatment plant and sanitary sewerage sys. $350,000. Stevens & Koon, Spalding Bldg., Portland, consult. engrs. Frank Oener, city engr. CD 1/30.

Tenn., Cookeville—City, City Hall, plans by C. M. Harrub Eng. Co., 408 Presbyterian Bldg., Nashville, sewer disposal plant, sewer extens. $600,000. Holla Burgess, c/o owner, supt. Sewer Dept. CD 5/16.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $28,000; other public works $50,000; industrial buildings $68-000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

♦	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

Tex., Carrizo Springs—City, voted bonds, sanitary sewerage sys. imprvs., incl. treatment plant alterations. $100,000. The Marvin Turner Engineers, Nalle Bldg. Annex, Austin, consult. engrs. CD 2/23.

Tex., Dallas—Sam Lett & Thomas Gay, 3336 Inwood Rd., sanitary and storm sewers, 1st ½ of 180 tract, $60,000; sanitary and storm sewers, 2nd ½ of 180 acre tract, $65,000. Walnut-Hill-Midway tract.

Tex., Deer Park—Citiy, voted bonds, sewage treatment plant, $80,000; sanitary sewers, $70,000. Garrett Eng. Co., 5008 Almeda Rd., Houston, consult. engrs. CD 2/6.

Tex., Edinburg—City, Jack Ellingson, mgr., Edinburg, addnl. sanitary sewer lines in areas inside city limits not now served by lines, $141,000; sanitary sewer lines in areas adjacent to city limits which will soon be incorporated inside city limits, $75,000.

Tex., Houston—Henry & Edmonds, 8702 Humble Rd., sanitary sewer lines, $50,000; sewage disposal plant, $60,000, east of Aldine-Westfield Rd. Howe & Wise, 4119 San Jacinto St., consult. engrs.

Tex., Kingsville—City, Kingsville, bond election Apr. 11, sewer outfall line, $200,000; sewer lift station, disposal pump. unit, $163,000.

Wash., Gig Harbor—Town, Town Hall, sewerage sys., $940,000. H. P. Harstad & Assoc., Smith Tower, Seattle, Zone 4, consult. engrs. CD 2/16, under Alaska, Gig Harbor.

Wash., Pomeroy—City, City Hall, sewage disposal plant, $174,382; sewer line extens. ,$29,078. G. D. Hall & Assoc., Larson Bldg., Yakima, consult. engrs. CD 11/28.

Wash., Seattle—City, County-City Bldg., Zone 4, interceptor sewer in Admiral Way and 52 Ave. S. W., with outfall into Puget Sound at W. Spokane St. and Beach Dr., $152,000., underground pumping plant, $60,000. R. W. Finke, city engr. CD 3/21/46.

Wis., Blooming Grove—Town, 3398 Monona Dr., Madison, sanitary sewerage sys., $200,000. General Eng. Co., Portage, consult. engr.

Wis., Chippewa Falls—City, L. C. Millard, clk., interceptor sewers, sewage treatment plant. $150,000. Banister Eng. Co. 1549 University Ave., St. Paul, Minn., consult. engr.

Alaska, Anchorage—City, City Hall, sewer mains, $131,-550. C. Tryck, city engr.

Alaska, Cordova—Town, Town Hall, sewers, $250,000. Flora Eng. Co., 1717 E. Colfax St., Denver, Colo., consult. engr.

Alaska, Ketchikan—City, City Hall, 10,850 ft. sanitary sewers, 5,420 ft. storm sewers. $250,000. L. D. Hubbard, city engr.

Alaska, Kodiak—City, City Hall, sewers, $200,000. Hubbell & Waller Eng. Corp., 216 Ward St., Seattle, Wash., consult. engrs.

Alaska, Petersburg—Town, Town Hall, sewerage sys. $382,280. F. J. Toner, Juneau, consult. engr. CD 8/9/45.

BRIDGES

▲ **Arkansas**—State Hy. Dpt., Little Rock,

Crittenden Co.—overpass across railroad at West Memphis, $500,000.

Hot Spring Co.—overpass across Hy. 270 at Malvern, $378,888.

Pike Co.—2 bridges between Board Campand Norman, $150,000.

Polk Co.—2 bridges on Hy. 8 between Mena and Oklahoma State Line, $160,000.

Pulaski Co.—3 overpasses at south end Main St. in Little Rock, opening a road connecting Main St. to Hys. 65 and 167, $1,009,000.

Randolph Co.—bridge on Fourche Creek Hy. 115, Pocahontas, $180,000. CD 12/24/43.

▲ **Indiana—Kentucky—Illinois**—Indiana Toll Bridge Comn., Evansville.

Indiana—Kentucky Memorial Bridge over Ohio River from Lawrenceburg, Ind. (U. S. Rte. 50) to Boone Co., Ky. (U. S. Rte. 20).

Wabash River Memorial Bridge over Wabash River, from near Mount Vernon, Ind. to Illinois, $6,000,000, Parsons, Brinckerhoff, Hall & Macdonald, 51 Broadway, New York 6, N. Y. will make traffic control and earning surveys, CD 3/3/48.

▲ **Ohio**—State Hy. Dpt., T. J. Kauer, Columbus, bridge over Muskingum River at Marietta. $1,500,000. D. B. Steinman, 117 Liberty St., New York, N. Y., consult. engr. CD 9/22/48.

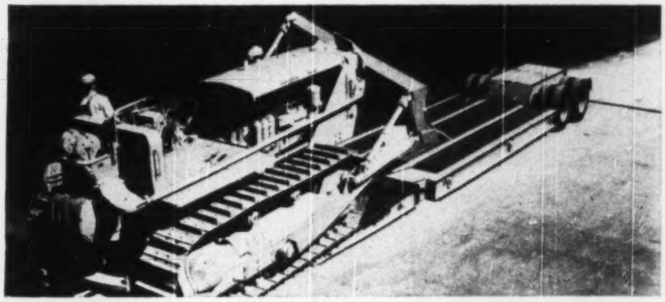
▲ **Tenn., Chattanooga** — Chattanooga Terminal Auth., Chattanooga Bank Bldg., grade crossing separations, railroad relocation and terminal facilities. $10,000,-000-$15,000,000. L. A. Schmidt, Jr., and Polk, Powell & Hendon, 817 Broad St., consult. engrs. CD 6/16/47.

▲ **Tex., Dallas**—Dallas Co., Courthouse, Simonds Road Bridge approaches in southeast Dallas Levee Dist. $50,000; Industrial Blvd. bridge near Dal Hi Stadium and approaches, $50,000; Buckley Ave. approach

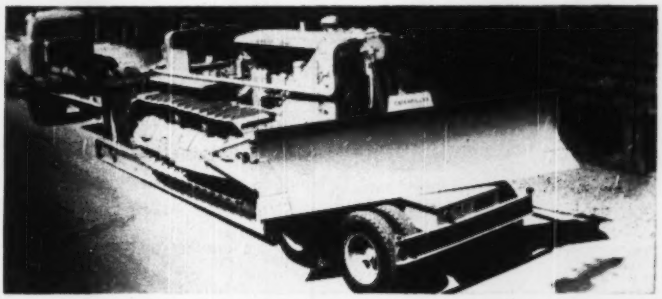
Continued on page 281

NEW EQUIPMENT

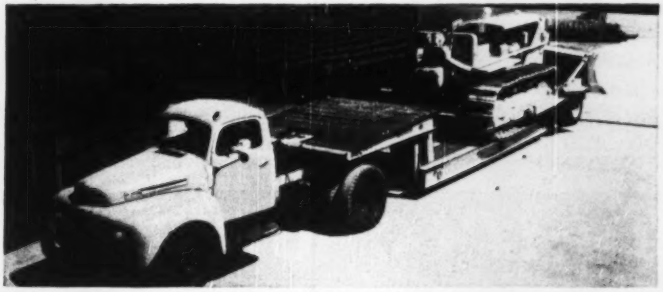
The Martin Machine Company, Kewanee, Illinois, has introduced a new trailer featuring a patented Folding Gooseneck which, when lowered to the ground, forms a loading ramp. The new trailer, in capacities up to 100-tons, eliminates cumbersome loading ramps and cribbing, reduces idle man and equipment hours. Loading can be accomplished by one man in a fraction of the time formerly required by several men. Low platform height, accomplished by front loading, provides greater clearance for viaducts, bridges and wires, assuring fast, safe movement between jobs. Like other Martin "Carryhaul" trailers, the new Folding Gooseneck will be sold exclusively through "Caterpillar" dealers. The sequence photos below show actual operation of the new Martin Folding Gooseneck.



Folding Gooseneck lowered to form ramp for loading D-8 "Caterpillar". Loading ramps and cribbing are eliminated. One man loads.

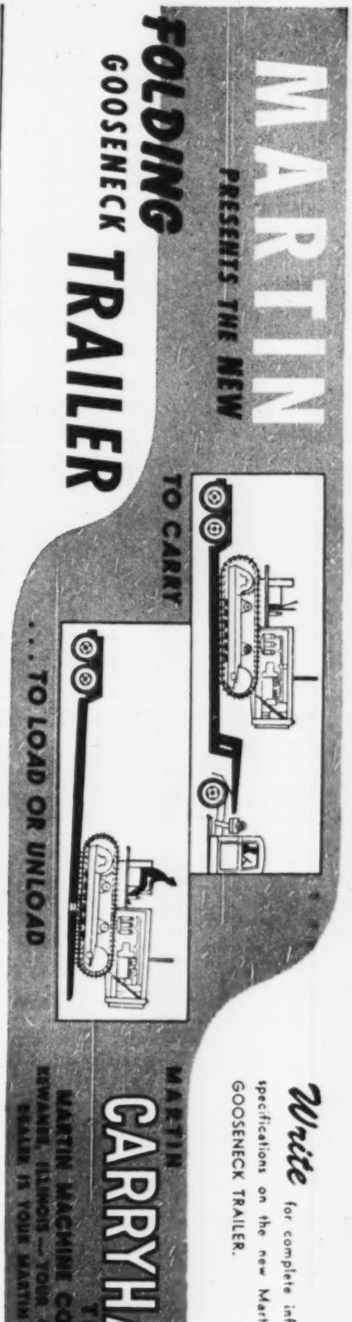


Folding Gooseneck being raised to towing position. Loading is easily accomplished in 5 minutes.



Ready to roll. Note low platform height which provides maximum clearance for viaducts, wires, bridges — greater safety.

(advertisement)



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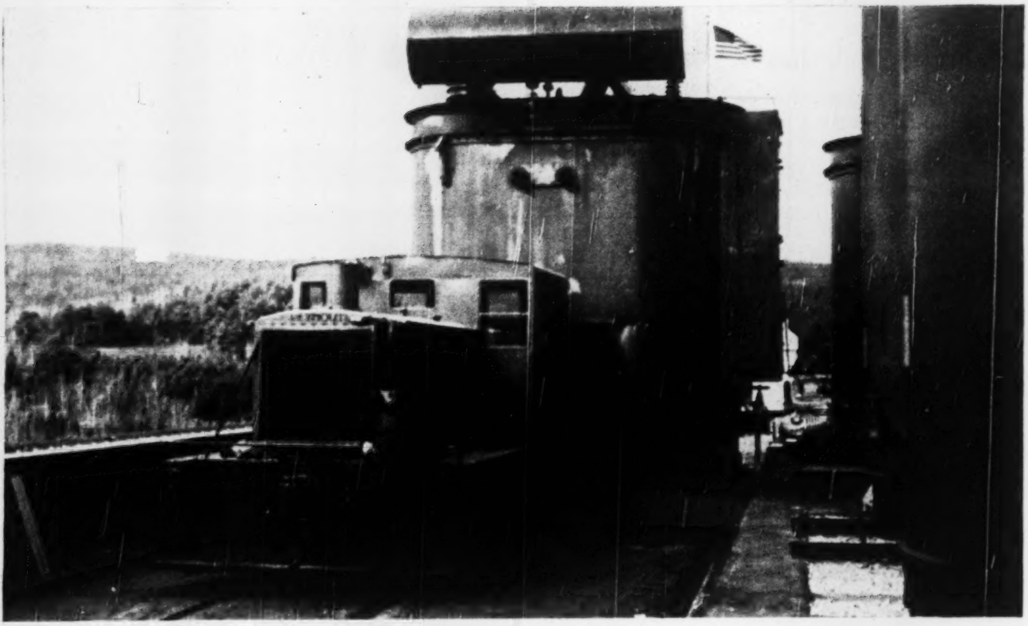

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Heavy hauling jobs like this are all in the day's work for this sturdy 30-ton Plymouth gasoline locomotive. Chiefly employed for general haulage of freight from main lines to the Connecticut River Power plant at East Barnet, Vt., the Plymouth Locomotive is always available for other intra-plant transtation of machinery and supplies.

Mr. H. B. Soper, division superintendent of the plant, states that in two years of service this Plymouth has never been laid up for repairs The total amount of maintenance required, he says, consists only of regular lubrication.

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PLYMOUTH LOCOMOTIVE WORKS • Division of The Fate-Root-Heath Co., Plymouth, Ohio, U.S.A.

Continued from page 278

to Continental Viaduct (Lamar-McKinney Bridge), 100,000; Forest Ave. Bridge and connections to Bonnie View Rd., $1,722,000. Koch & Fowler, Great Natl. Life Bldg., consult. engrs, H. Klinger, co. engr. CD 1/27.

▲ **Washington**—State Hy. Dpt., Olympia,

Franklin and Benton Counties—second bridge across Columbia River between Pasco and Kennewick in addn. to already-authorized replacement of recently-destroyed bridge, **$6,000,000.**

Whatcom Co.—steel bridge across Nooksack River on Guide Meridian, with rein.-con. approaches, **$570,000.** W. A. Bugge, state hy. dir.

STREETS AND ROADS

▲ **Arkansas**—State Hy. Dpt., Little Rock,

Arkansas, Prairie and Monroe Counties—wid'n. 21 mi. Hy. 79, Stuttgart, **$1,058,000.**

Benton Co.—surf. 9.8 mi. Hy. 102 between Maysville and Gravette, **$316,700.**

surf. 4.14 mi. on Hy. 100 between Bentonville and Bella Vista, **$209,000.**

Boone Co.—surf. 8.4 mi. between Harrison and Bergman, Hy. 43, **$252,000.**

street wid'n. less than 1 mi. in Harrison, part of Hy. 65, **$86,000.**

Bradley Co.—resurf. 15 mi. Hy. 4 between Warren and Monticello, **$340,000.**

Carroll Co.—grav. 6 mi. Hy. 21 from Berryville north, **$146,000.**

grav. 6 mi. Hy. 21 green Forest north, **$1,460,000.**

Chicot Co.—surf. 12.86 mi. Hy. 82 between Monroe and Lake Village, **$546,000.**

Clark Co.—wid'n surf. Hy. 67 between Gurdon and Arkadelphia, **$380,000.**

Columbia Co.—grading, resurf. 12.4 mi. Hy. 132 south of Magnolia, **$250,000.**

Conway Co.—wid'n, resurf. 1 bridge 9 mi. on Hy. 64 east and west of Morrilton, **$365,000.**

Craighead Co.—grading, resurf. 5 mi. Hy. 1 south of Jonesboro, **$233,000.**

resurf. 1.5 mi. Main St. in Jonesboro, **$60,000.**

Crawford Co.—reconstr. 7 mi. Hy. 64 between Van Buren and Alma, **$425,000.**

resurf. 10 mi. Hy. 59 from Cedarville north, **$361,000.**

Crittenden Co.—constr. work on Marked Tree—Gilmore Rd., Hy. 63, **$592,740.**

construction work on Marked Tree—South Road Hy. 63, **$546,776.**

Cross Co.—grading, surf. 6 mi. Hy. 1 between Vandale and Cherry Valley, **$247,000.**

Franklin Co.—surf. 5 mi. Hy. 23, Ozark north, **$125,000.**

Fulton Co.—surf. 9.9 mi. from Mammoth Spring south of Hy. 63, **$360,382.**

Garland Co.—resurf. 1½ mi. Central Ave., Hot Springs, **$75,000.**

Greene Co.—grading, surf. 5 mi. Hy. 1-W., north of Paragould, **$185,000.**

surf. 6 mi. Hy. 132 between Paragould and Schug, **$150,000.**

Hot Spring Co.—grading, surf. 10 mi. Hy. 84 between Bismarck and Hy. 270, **$150,000.**

Jackson Co.—surf. 6.6 mi. Hy. 14 between Amagon and Waldenburg, **$286,000.**

surf. 10 mi. Hy. 37 between Amagon and Beedeville, **$244,000.**

Johnson Co.—surf. 7 mi. Hy 21 from Clarksville, **$125,000.**

Lafayette Co.—surf. 13.4 mi. Hy. 29 north and south of Bradley, **$435,000.**

Lawrence Co.—surf. 8.2 mi. Hy. 63 between Portia and Ravenden and signal light at Ravenden, **$218,000;**

Logan Co.—surf. 10 mi. Hy. 109 between Paris and Magazine, **$150,000.**

Lonoke Co.—surf. 3.86 mi. Hy. 67 between Ward and Beebe, **$412,000.**

Miller Co.—surf. 5.7 mi. on Hy. 67 between Fulton and Texarkans, **$427,000.**

Mississippi Co.—wid'n., grading, 14.5 mi. Hy. 18 between Blytheville and Manila, **$237,000.**

Monroe Co.—reconstruction work on Hy. 70 near Brinkley, **$317,000.**

Nevada Co.—resurf., grading 6.5 mi. Hy. 19 between Prescott and Waldo **$110,000.**

Ouachita Co.—grading, surf. 6.8 mi. Hy. 4 east of Camden, **$299,000.**

Perry Co.—surf. 5 mi. Perryville west of Hy. 60, **$170,000.**

Phillips Co.—grading, surf. Hy. 20 near Helena and railroad signal on Hy. 20, **$115,000.**

Pike Co.—surf. 9.4 mi. Hy. 8, Glenwood, **$350,000.**

surf. 5 mi. Hy. 26 between Antoine and Delight, **$150,000.**

Pope Co.—grading, surf. 2.9 mi. Hy. 7 between Russellville and Dardanelle, **$220,000.**

surf. 10.2 mi. Hy. 27 between Dover and Hector, **$300,000.**

Pulaski Co.—surf. 3.3 mi. Little Rock—Sweet Home Pike, **$720,000.**

St. Francis Co.—resurf. 14.4 mi. Hy. 70 near Blakfish Lake, Forrest City, **$666,000.**

Sebastian Co.—resurf. 2.8 mi. Midland Ave. in Ft. Smith, **$110,000.**

Sevier Co.—repaving 10 mi. road DeQueen, **$478,000.**

Sharp Co.—surf. 11 mi. Hy. 11 between Cane City and Evening Shade **$417,200.**

Washington Co.—grading, drainage 6.3 mi. Hy. 71 between Fayetteville and Springdale, **$408,000.**

grading, surf. 0.06 mi. Hy. 62 connecting Fayetteville, **$135,000.**

grading, drainage 8.3 mi. Hy. 45 between Goshen and Hindsville, **$266,000.**

Woodruff Co.—surf. 4 mi. Hy. 39 from Morton south, **$71,000.**

How Burgess Norton Mfg. Co. Saved On Construction Costs, Erection Time with

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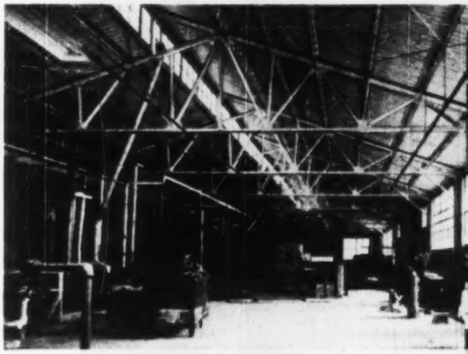

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State . . . .

Yell Co.—surf. 5 mi. Hy. 26 between Rover and Scott co. line, **$435,000**. Alfred E. Johnson, Little Rock, engr.

▲ **Colo., Denver**—City and Denver Co., City and County Bldg., wid'n. Colorado Blvd. from E. 52 Ave. to Hampden Ave., **$4,682,500**; constr. 46-48 Avenue Freeway, major east-west highway designed to route truck traffic through industrial areas, eastern terminus will be at Watkins on U. S. Hy. 40, western terminus at Clear Creek Canyon Highway above Golden, **$6,666,600**; wid'n. Colfax Ave. from Colorado Blvd. to Quebec St., **$1,300,000**; straightening, exten. Sixth Ave. to make it effective interchange with Valley Hy., **$3,900,000**; wid'n., imprv. 32 Ave. to make a principal thoroughfare to airport, **$1,334,300**; reconstr. Alameda Ave., **$3,000,000**; reconstr., wid'n. Federal Blvd., primary north-south artery, **$2,535,000**; reconstr., wid'n. University Blvd.-York St. to serve University of Denver and industrial area around 38 Ave., **$2,075,000**; wid'n. E. 14 Ave. to 60 ft., **$1,513,600**; Market St., inner loop of Valley Hy., **$5,697,000**; wid'n. Sheridan Blvd. to 60 ft., **$2,030,000**; construct, reconstruct Speer Blvd.-Forest Dr., **$554,400**, wid'n. E. 16 Ave. to 60 ft., **$300,000**; wid'n. Broadway to 72 ft. between Yale Ave. and Bayaud St., **$408,000**; wid'n. Grant St. to 48 ft., **$196,000**; wid'n. Logan St. to 48 ft., **$207,000**; wid'n. Clarkson, Washington and Emerson Sts. to 48 ft. to divert some traffic from Grant and Logan Sts., **$1,010,000**; imprv. Santa Fe Blvd. and Kalamath Sts., two principal access roads for Valley Hy., **$455,800**. Terry Owens, City and County Bldg., city engr.

Idaho, Alameda—City, City Hall, imprv., surf. streets, sidewalks, curbs, gutters, **$220,000**. R. J. Briggs & Assoc., K. T. Bronken, 619 Grove St., Boise, consult. engrs.

La., Thibodaux—Lafourch Parish Police Jury, c/o M. G. Riviere, secy., bond election Apr. 11, road imprvs., Dist. 8, **$403,000**. CD 10/25/45.

O., Toledo—City, Arnold V. Vinch, mgr., wid'n., repaving Monroe St. from Summit St. to Auburn Ave. **$373,918**. M. J. Curtiss, city street div. engr. CD 10/17.

S. D., Hot Springs—City, paving, curbing, guttering. **$133,420**. Scott Eng. Co., Watertown, consult. engr.

Tex., Caldwell—Burleson Co., Courthouse, county road imprvs., grading, drainage, surf. **$125,000**; approx. 11 mi. farm-to-market, **$110,000**. Frank Perrin, co. engr.

Tex., Crystal City—Zavala Co., Courthouse, voted bonds, road imprvs., wid'n. 22 mi. highway, Crystal City toward LaPryor, **$224,994**; 10 mi. Calpak to 5 mi. south of Batesville, **$102,270**; 6 mi. Batesville to Frio Co. line, **$61,362**; from Zavala Co. line to Moore, **$61,362**. CD 1/27.

▲ **Tex., Dallas**—Dallas Co., Courthouse, West Dallas drainage and street imprv., **$151,050**; Bonnie View Rd. exten. to Lancaster city line, **$75,000**; imprvs., surf. Westmoreland Rd. and connecting concrete Trinity River Bridges, **$132,000**; imprvs., paving Jefferson Blvd. from east city limits of Cockrell Hill to county line, **$318,000**; Myers Road imprv. and surf. U. S. Hy. 80 to Shady Grove Rd., **$206,000**; Grauwyler Rd.-Elm Fork bridge and road imprv., **$203,000**; Brittain Rd. imprvt. and surf. **$55,000**; paving imprv. Sylvan-Maple Ave. to State Hy. 1, **$918,000**; imprvs., surf. N. Beckley Ave. from State Hy. 1 to city limits, **$75,000**; drainage Industrial Blvd., **$85,000**; new road from Forest Ave. to Hy. 246, **$192,000**; Mallory Birge road imprvs., surf. from U. S. Hy. 75 to county line east of Seagoville, **$481,000**; 8 St. imprvs., surf. from Forest Ave. to Corinth, **$65,000**; imprv., hard paving Old Greenville Interurban-Skillman-Garland Rd. from Mockingbird Lane to Garland, Tex., **$1,369,750**; Belt Line Rd., 90 mi. long new road encircling the city, asph. paving, etc., **$3,392,000**; imprvs., hard paving Hampton-Inwood Rd. near Red Bird Airport, through Dallas to Belt Line road in east part of county, **$4,750,000**; imprvs., paving Dowdy Ferry Rd. from U. S. Hy. 75 to U. S. Hy. 175, **$477,000**; Valley View Lane Rd. imprvs. and surf. from east end of Farmers Branch to State Hy. 114, **$199,000**; imprvs., paving, drainage, Denton Tap Rd. from Belt Line Rd. to county line, **$120,000**; Riverview Rd. imprvs., paving, State Hy. 183 to Bell Line Rd., **$425,000**; imprvs., paving Estell-Euless Rd., from State Hy. 114 to county line, **$100,000**; imprvs., paving, etc. Lake June Rd., U. S. Hy. 175 to Belt Line Rd., **$340,000**; imprvs., paving Lancaster to Hutchins, Texas Rd., **$260,000**; imprvs., surf. Military Dr., U. S. Hy. 80 to Mesquite, **$1,135,250**; imprvs., paving Centerville-Ferguson Rds., U. S. Hy. 80 to old U. S. Hy. 67, **$363,500**. Koch & Fowler, Great Natl. Life Bldg., consult. engrs. E. Klinger, co. engr. CD 1/27.

Tex., Dallas—Sam Lett & Thomas Gay, 3336 Inwood Rd., street contr., paving, 1st ½ of 180 tract, **$65,000**; street contr., paving, 2nd ½ of 180 tract, **$75,000**, in Walnut Hill-Midway tract.

▲ **Tex., Edinburg**—Hidalgo Co., Edinburg, bond election May 6, through-county road, **$1,500,000**. CD 7/11.

Tex., Nacogdoches—City, Grady Stallings, mgr., voted bonds, Feb. 28, c. conc. paving, **$600,000**. V. A. Stewart, city engr. CD 2/15.

Tex., Woodsboro—Refugio Co. Rd. Dist. 2, Woodsboro, project indefinitely abandoned, road constr. and surf. **$125,000**. CD 9/23.

Washington—State Hy. Dpt., Olympia.

Benton Co.—New Kennewick-Plymouth hy. approach to Kennewick, **$451,500**.

Wash., Yakima—Yakima Co., County Courthouse, grading, draining, ballasting, surf., Butterfield, Commonwealth, Young, Terrace Dr., Locust Lane, Norman, Holland Church and Holland cemetery roads in Moxee Area, **$109,000**; grading, surf., oiling 2 mi. Beam Rd., 0.75 mi. Wendell Phillips Rd. and 2.1 mi. Bishop Rd. in Moxee valley, **$77,600**. O. L. Brashears, co. engr.

Continued on page 285

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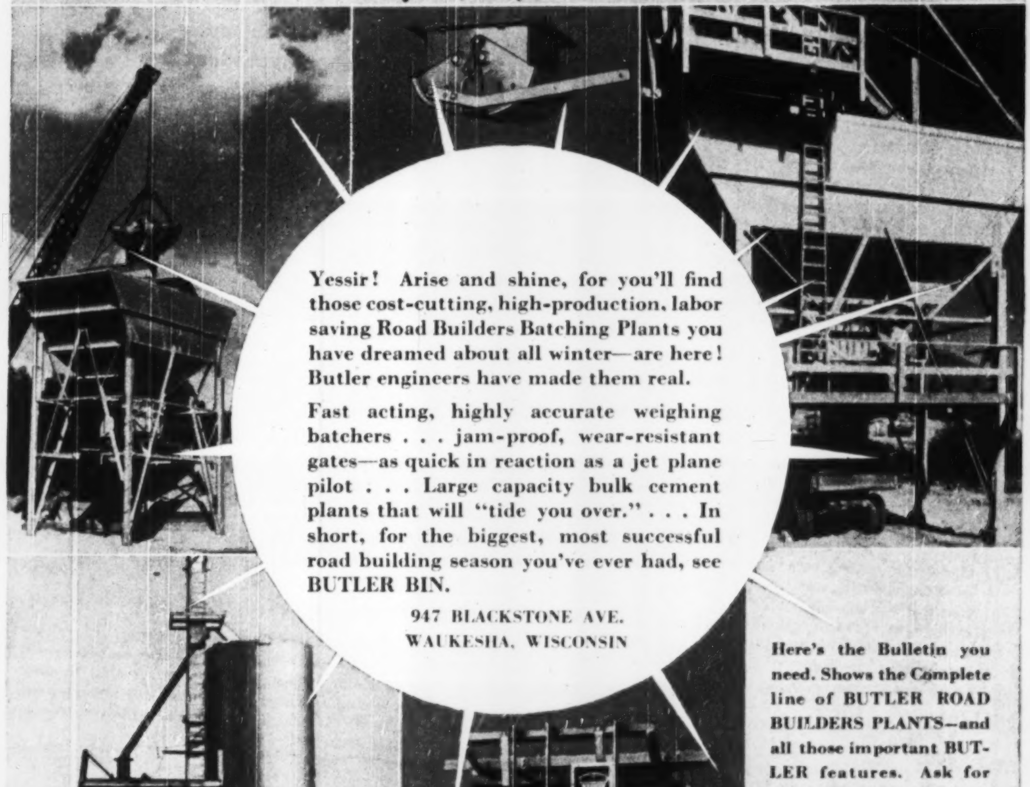

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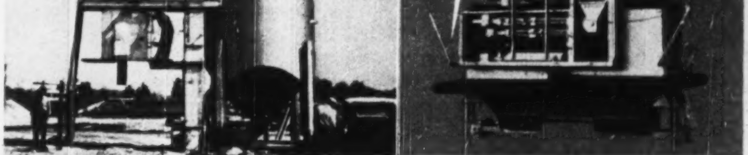

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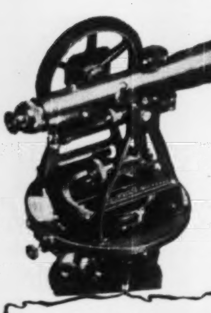

WHAT A LEADING TECHNICAL EDITOR WROTE ABOUT ALUMINUM TRANSITS AFTER ANALYZING HOW GURLEY MAKES THEM

Reproduced from a full-length article in the December 1949 issue of MATERIALS & METHODS, written by H. R. Clauser, its Associate Editor. We will gladly send you reprints of the entire article on request.

Aluminum Used Successfully in Precision Instruments

A PICTORIAL STORY

Requirements of accuracy during a long service life are controlling factors in selection of materials for engineering and surveying instruments.

● IN THE MANUFACTURE of precision instruments, the selection and careful processing of materials is of prime importance. Accuracy as well as long service life with a minimum of adjustment and repair are the quality standards that must be met, and to meet them, astute materials engineering coupled with expert workmanship are required. Perhaps no better example of the combination of these two factors can be found than at W. & L. E. Gurley, Troy, N. Y., where precision instruments are produced not only for engineering and surveying, but also for other fields such as meteorology and aeronautics.

Copper alloys and aluminum alloys are the principal materials used in the company's surveying instruments. One of the earliest uses of aluminum in this country was in a Gurley transit 73 years ago. And since that early application, aluminum has proved satisfactory in an increasing number of instrument parts. The main reasons for adopting the use of aluminum were: (1) light weight; (2) relatively high strength and yield point; (3) lends itself to precision machining; (4) good ductility; (5) relatively good corrosion resistance, especially in sulfur atmospheres; and (6) does not distort nor "grow" with age. The aluminum alloys most used at present are 14SW, 61ST, 356 and 13. A thorough test program insures against any differences in accuracy within a temperature range of —80 F and +165 F.

The accompanying pictures illustrate a number of the steps involved in the production of various parts making up the transit.

PARTS FOR
SURVEYING INSTRUMENTS
W.&L.E. GURLEY, TROY N.Y.

1—Shown here are the aluminum parts used in Gurley surveying instruments. At top, left and right is a 14SW forging for a horizontal transit limb before and after being machined, anodized and dyed. In the center is a sand casting of 356 alloy for the truss standard. Lower row, left to right, is a transit leveling head sand casting of 13 alloy, a swaged and spun tubing for telescope focusing slide of 51ST alloy, and a graduated vertical circle made of 61ST aluminum sheet which has been anodized and dyed.

You're So Right, Mr. Editor—

The first Gurley Aluminum Transit, built in 1876, was finally retired after 50 years of active service—and then for sentimental reasons only. It met every field "requirement of accuracy during a long service life"—as every Gurley Transit continues to do all over the world.

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GURLEY
Surveying and Scientific Instrument Makers
Since 1845

Continued from page 282

Alaska, Cordova—Town, Town Hall, bui ~~~~ heads and streets. $250,000. Flora Eng. Co., 1717 E. Colfax St., Denver, Colo., consult. engr.

Alaska, Skagway—City, City Hall, street work, drainage structures. $150,000. F. J. Toner, Juneau, consult. engr. CD 8/17/45.

Ont., Sudbury—City. H. P. McKeown, clk., street program of maintenance and imprvs. paving Lloyd St. Beech St. and Elm St. W., etc. in 1950. Approx. $558,473. M. D. Stewart, c/o owner, engr.

EARTHWORK, WATERWAYS

▲ **Illinois**—State of Illinois, Springfield, general survey for flood control project of Hickory Creek in Joliet, incl. levees, drainage facilities, etc. also re-routing present channel into Des Plaines River, some sewer constr. $2,000,000-$4,000,000. Jenkins, Merchant & Nankivil, 611 E. Miller St., Springfield, consult. engrs. CD 4/13/45.

Tex., Pharr—Valley Fruit Co., Roy Weir, Pharr, water storage reservoir for plant. $100,000.

† **Utah**—Bureau Reclamation, Dpt. Interior, Provo, 40 m.g. concrete terminal reservoir on Salt Lake Aqueduct, Provo River Proj.

† **Wash., Anacortes**—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, dredging small boat harbor, $150,000.

B. C., Victoria—Acting Secy. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., breakwater at Friendly Cove, Nootka Island, Approx. $75,000; boat barbor at Roberts Bay, Approx. $240,000. R. Blais, c/o owner, engr.

N. S., Brooklyn—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., breakwater repairs, imprvs., Approx. $145,000. R. Blais, c/o owner, engr.

N. S. Dingwall—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., dredging. Approx. $130,000. R. Blais, c/o owner, engr.

N. S., Ingonish—Acting Secy. Dpt. P. Wks., Hunter Bldg. Ottawa, Ont., breakwater wharf replacements at North Ingonish, Approx. $100,000. R. Blais, c/o owner, engr.

Ont., Midland—Acting Secy. Dpt. P. Wks. Hunter Bldg., Ottawa, dredging harbor and from Midland to Pointe au Baril, Approx. $119,000. R. Blais, c/o owner, engr.

AIRPORTS

Neb., Omaha—ADMINISTRATION—City, City Hall, 18 and Farnam Sts., administration bldg. addn. at municipal airport. $200,000. E. W. Woodbridge, city engr. CD 3/26/47.

FOREIGN

Ceylon, Colombo—Govt. of Ceylon, Colombo, plans plant for mfg. of ammonium sulfate, 80,000 tons capacity yearly. $500,000. Architect, c/o Counsellor Embassy of Ceylon, 2148 Wyoming Ave. N.W., Wash., D. C., U. S. A.

New Zealand, Tokoroa—New Zealand Forest Products, Ltd., Wellington, plans chemical wood pulp mill. Approx. $1,000,000.

LATIN AMERICA

Bolivia—Bolivian Development Corp., La Paz, plans 400 mi. Cochambamba-Santa Cruz Hy., $16,000,000. Knappen, Tippetts Abbett Eng., Co., 62 W. 47 St., New York, N. Y., have signed contract to handle overall engineer. and management of project. CD 11/3.

Colombia, Bogota — Municipality, Bogota, plans new central market on 20 acre site. $500,000.

Cuba, Havana—Peliculas Mexicanas, S. A. Ejido, 43, Mexico, D. F., Mexico, plans cinema. $255,000-$400,000.

Mexico, Arcelia—Mexican Govt., Sria. de R.H., Baldera, 94, Mexico, D. F. Mexico, plans irrigation dam. $500,000.

Mexico, Mexico City—Mexican Govt., Sria. de Gobernacion, Mexico, D. F., plans national penitentiary. $1,250,000.

Mexico, Mexico City—Mexican Govt., Sria de E. P., Mexico, D. F., plans 60,000 seat national stadium. $6,000,000.

Peru, Lima—Peliculas Mexicanas, S. A. Ejido, 43, Mexico, D. F., Mexico, plans cinema. $255,000-$400,000.

Venezuela, Caracas—Phillips Oil Co., City Natl. Bank Bldg., Houston, Tex., plans refinery and wax plant. Approx. $7,000,000

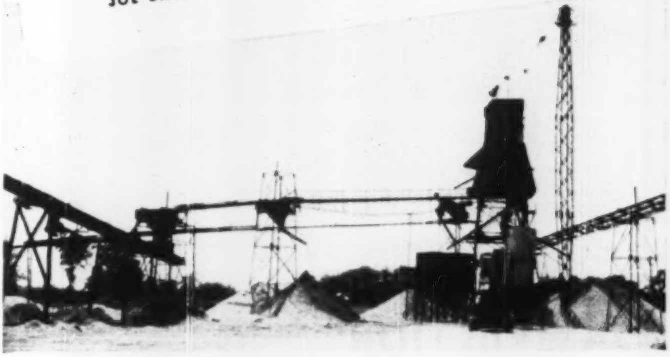
PUBLIC BUILDINGS

Ala., Lanett—HOUSING—Lanett Housing Auth., Lanett, 200 housing units. Approx. $750,000.

Ark., Arkadelphia — HOUSING — Arkadelphia Housing Auth., Arkadelphia, 75 low-cost rental housing units. $507,500. CD 1/23.

300 Yards a Day for 3½ Years... "I couldn't want a better screen."

JOE BALES



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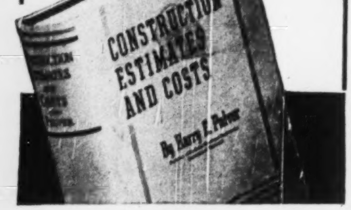

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▲ **Calif., Carmel**—SCHOOLS—Carmel Unified School Dist., Carmel defeated **$1,000,000** bonds, school bldgs. CD 1/27.

▲ **Calif., Chico**—SCHOOLS—Chico High School & Elementary School Dist., Chico, plans by Thomson & Evans, 1308 E. 38 St., Oakland, schools, **$1,800,000.** CD 11/17/48.

Calif., Concord—SCHOOL—Mt. Diablo Unified School Dist., Concord, plans by Reynolds & Chamberlain, 3833 Piedmont Ave., Oakland, John Reid, 109 Stevenson St., San Francisco, Confer & Willis, 336 40 St., Oakland, and Anderson & Simonds, 2800 Park Blvd., Oakland, wood, steel 12-classroom Bel Air School, **$250,000.** CD 12/15.

Calif., El Monte—SCHOOL IMPRVS.—City High School Dist., defeated **$600,000** bonds auditorium and gymnasium at Rosemead High School. CD 12/23.

Calif., Manhattan Beach—POLICE STATION, etc.—City, **$325,000** bond election Apr. 11, police station and city hall exten.

Calif., Monterey—LIBRARY—City, City Hall, voted $550,000 bonds Feb. 7, library, **$350,000.** Wurster, Bernardi & Emmons, 402 Jackson St., San Francisco, archts.

Calif., Palo Alto—SCHOOL—Palo Alto Unified School Dist., 543 Channing Ave., plans by Birge M. Clark & Walter Stromquist, 321 Channing Ave., frame, stucco Jordan Junior High School addn. **$250,000.**

▲ **Calif., Redondo Beach**—SCHOOL FACILITIES—South Bay Union High School Dist., **$1,490,000** bond election Mar. 28 school facilities. CD 10/19.

Calif., San Leandro—SCHOOL—San Leandro Elementary School Dist., 451 Hepburn St., **$975,000** bond election Apr. 4, school addns. CD 1/21/46.

▲ **Calif., San Lorenzo**—SCHOOL—San Lorenzo Elementary and High School Dists., San Lorenzo, voted **$400,000** and **$1,500,000 bonds**, elementary and high school addns. CD 11/17/48.

▲ **Calif., San Rafael** — SCHOOLS — San Rafael High School Dist., San Rafael, defeated **$795,000** bonds high school addn. Donald B. Kirby & Thos. B. Mulvin, 461 Market St., San Francisco, archt. CD 11/29.

▲ **Calif., San Rafael**—SCHOOLS—San Rafael Elementary School Dist., voted $646,000 bonds schools, **$1,027,500.** Donald B. Kirby & Thomas B. Mulvin, 461 Market St., San Francisco, archts.

Calif., Whittier—HOSPITAL—City, City Hall plans by J. Dewey Harnish, 212 E. B St., Ontario, reinforced block, masonry, Murphy Memorial Hospital addn. **$300,000.** CD 11/20/46.

Colo., Aurora—SCHOOLS—Bd. Educ., School Dist 28-J, Consolidated Dist. of Adams and Arapahoe Counties, 9735 E. Colfax St., plans by Atchison & Kloverstrom, engrs. and archts., 1245 Monaco Parkway Denver, 2 schools at 13 and Kenton Sts. and Montview and Moline Sts. **$600,000.**

▲ **Conn., Bristol**—HOUSING—City of Bristol Housing Auth., Fred. O. Zurrell, chn., 120 family frame units, **$1,200,000.**

Conn., Enfield—SCHOOL—Town, F. W. Cischalskie, clk., Town Hall, plans by Carl Malmfeldt Assoc., 36 Pearl St., Hartford, brick, concrete, steel school, Route 5. **$250,000.** CD 1/31.

Conn., New Haven—SCHOOL—City, Bd. Educ., 169 Church St., plans by Brown & Von Beren, Inc., 295 Sherman Ave., 2 story, brick, steel school addr., alterations, Davis St. **$275,000.**

Conn., Shelton—SCHOOL—Town, Bd. Selectmen, Town Hall, plans by Brown & Von Beren, Inc., 295 Sherman Ave., New Haven, brick, steel school, 8 classrooms, kindergarten auditorium, Sunnyside Park. **$250,000.** CD 1/30.

Conn., Wallingford—HOUSING—Boro of Wallingford Housing Auth., plans by C. R. Blanchard Jr., 85 Whitney Ave., New Haven, and C. W. Bailey, 152 N. Main St., 85 frame family units, **$900,000.** CD 3/17.

▲ **Del., Newark**—SCHOOL, etc.—University of Delaware, Newark, plans by Trautwein & Howard, 1411 Walnut St., Phila., Pa., agricultural school **$1,250,000;** chemical engineering laboratory addn., **$400,000.** CD 1/31/46.

▲ **Fla., Miami**—HOUSING—Miami Housing Auth., c/o Robert Law Weed, archt., 1527 Dupont Bldg., 500 housing units for colored, Project 2. Approx. **$1,500,000.** CD 11/22.

▲ **Fla., Miami**—HOUSING—Miami Housing Auth., c/o Edwin T. Reeder, archt., 1777 Biscayne Blvd., 500 housing units for colored, Proj. 3. Approx. **$1,500,000.** CD 11/22.

Fla., Tallahassee—DORMITORIES, etc.—State Bd. Control, Tallahassee, plans by Guy C. Fulton, and Associates, Peabody Hall, Gainesville, state archt., dormitories and stadium at Florida State University, **$250,000.**

Fla., Tampa—SCHOOL—Hillsborough Co., Courthouse, plans by Frank A. Parziale, 211½ Cass St., Oak Grove Junior High School, **$250,000.** CD 4/22/48.

▲ **Idaho, Boise**—AUDITORIUM—City, City Hall, plans by Hummel, Hummel & Jones, Sonna Bldg., municipal auditorium, **$1,500,000.** CD 12/8.

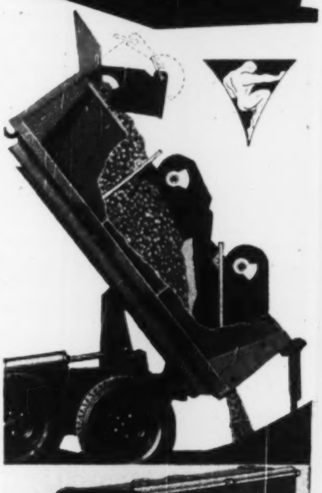
Idaho, Soda Springs—SCHOOL, etc.—School Bd., Soda Springs, school, shop and garage, **$300,000.**

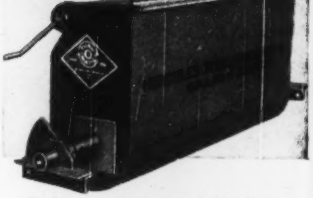
Ill., Chicago—HOME—Cook Co., County Bldg., Zone 2, plans by Raymond F. Houlihan, 30 N. Dearborn St., juvenile detention home at Roosevelt Rd. and Ogden Ave. **$500,000.**

▲ **Ill., Elgin**—HIGH SCHOOL—Bd. Educ., Dist. 6, 353 E. Chicago St., plans by Leroy W. Thompson, 355 Congdon Ave. and Elmer Bylleck & Assoc., assoc. archts., 120½ Grove Ave., Elgin, East Junior High School, Laurel Ave. and Liberty St. **$1,000,000.**

Continued on page 289

S-P-E-E-D BATCHING with HERCULES Turn-O-Matic CEMENT BOXES





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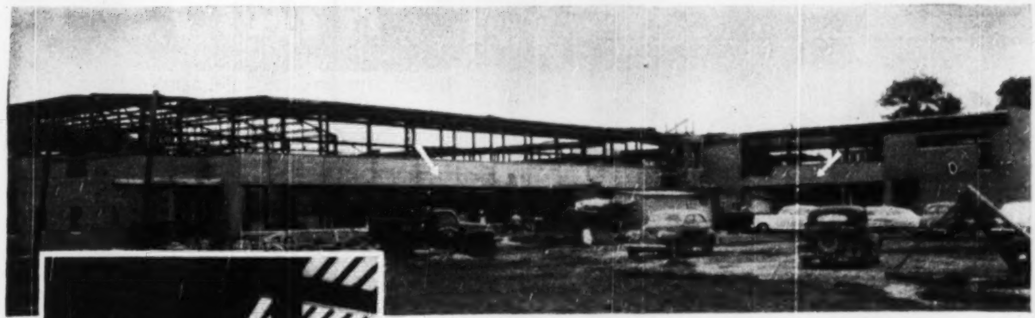
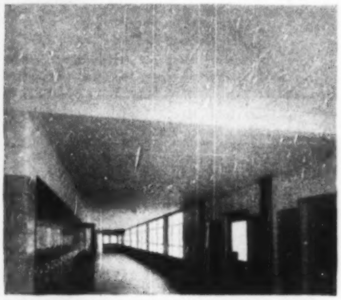


Fenestra insulated "C" Panels used as a spandrel between windows of first and second floors. Four panels high. 14' long panels laid horizontally.

Exposed corridor roof shows Fenestra "D" Panels laid flat side down. Main roof area under panels at right was finished with suspended plaster ceiling. Roof was finished over a large area early in construction.



Exposed ceiling of structural Building Panels wall to wall. Factory prime-painted, Panels provide a smooth surface, economically finished by adding a coat of paint. Attractive, noncombustible. Note Fenestra Hollow Metal Doors, Fenestra Intermediate Windows.

How Fenestra Steel Panels, Windows and Doors contributed to economical construction in the Robert N. Mandeville High School at Flint, Michigan.

Architects Bennett & Straight of Dearborn, Michigan, faced a familiar set of requirements:

—Large size, with a layout involving considerable perimeter for good daylighting.

—To be ready for fall occupancy.

—Limited budget, calling for low cubic-foot cost.

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They decided on a 7′ module. Classrooms were established in a 28′ width, with partitions spaced at 14′, 21′, 28′ and 35′ intervals. The structural steel frame was designed in a bay size of 14′ x 28′, saving weight in steel. Saving in roof construction was achieved with standard Fenestra Type D Panels on the 14-foot span. Standard Type C Panels formed spandrels between floors and the window walls of Fenestra Intermediate Projected Windows.

For the roofs of the 100′ x 100′ gymnasium and the shop, Fenestra Acoustical Holorib Roof Deck was used. This provides a surface for application of roofing materials. The underside provides a sound-absorbing, perforated surface. It is noncombustible, and being steel, withstands impact. Holorib was used as the permanent reinforcing form for the seats in the spectator stands of the gymnasium.

Fenestra Panels—Fenestra Windows—Fenestra Doors—combined in this structure to help the architects and contractor achieve their triple goal of a sizable, sound structure, speedily erected, at low cost.

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Contractor: Carl B. **Foster,**
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HYATT ROLLER BEARINGS

Continued from page 286

Ill., **Mount Vernon**—GYMNASIUM—Mount Vernon Township High School Dist., c/o Secy., voted **$225,000** bonds rein.-con., brick, steel high school gymnasium addn. CD 4/14.

Ind., Hammond—SCHOOL—Bd. School Trustees, 5935 Hohman Ave., plans completed by Warren S. Holmes, Olds Tower Bldg., Lansing, Mich., Parish Elementary School, 123 St. and Indianapolis Blvd., **$400,000.** CD 11/20/45.

Ia., Audubon—SCHOOL—Bd. Educ., plans by J. W. Radotinsky, 1401 Fairfax Trafficway, Kansas City, Kan., school $300,000. $100,000 bond election Mar. 13. CD 10/22/47.

Ia., Woodward—SCHOOL—State Bd. Control, E. 12 and Court Sts., Des Moines, plans by Ralph Arnold, state archt., 5711 Waterbury Circle, Des Moines, school, Woodward State School, **$650,000.**

Kan., Lawrence—DORMITORY—State Bd. Regents, New State Bldg., Topeka, plans by Chas. Marshall, state archt., Topeka, men's dormitory, University of Kansas, **$756,000.** Prof. George M. Beal, chn. Architectural Dpt., University of Kansas, Topeka, assoc. archt.

Kan., Nickerson—SCHOOL—Reno Co. Community High School Bd. of Trustees, Nickerson, plans by J. W. Radotinsky, 1401 Fairfax Trafficway, Kansas City, Kan., high school. **$500,000.**

Kan., Phillipsburg—HOSPITAL—Phillips Co., Phillipsburg, plans by T. W. Williamson Co., National Bank of Topeka Bldg., Topeka, hospital, **$275,000.**

Ky., Hopkinsville—HOSPITAL—Commonwealth of Ky., Div. Eng. & Constr., New State Bldg., Frankfort, plans by H. Lawrence Casner, Madisonville, Negro Ward addn., Western State Hospital, **$600,000.** Howard Bordewich, Madisonville, consult. engr. J. B. Rieman, new State Office Bldg., Frankfort, state engr.

Ky., Lexington—HOSPITAL—Commonwealth of Ky., Div. Eng. & Constr., New State Bldg., Frankfort, plans by Frankel & Curtis, 162 W. Short St., Negro Ward addn., Eastern State Hospital, **$600,000.** J. B. Rieman, New State Bldg., Frankfort, state engr.

Ky., Middlesboro—AUDITORIUM—City, City Hall, plans by Hitchcock & Estabrook, 521 Sexton Bldg., Minneapolis, Minn., 2 story, 90x200 ft. masonry, structural steel, rein.-con. slab auditorium, **$300,000.**

▲ **La., Bogalusa**—HOUSING—Town of Bogalusa Housing Auth., Bogalusa, 200 unit housing. **$1,420,000.**

▲ **Mass., Adams**—SCHOOL—Town, J. Franklin Farrell, supt. Schools, Commerical St., plans by James A. Brittan, 20 Federal St., Greenfield, 2 story, bsmnt., brick, steel high school, **$1,000,000.** CD 9/30.

Mass., Beverly—HOUSING—City of Beverly Housing Auth., plans by Ray Thibedeau, 81 Washington St., Salem, veterans housing. Approx. **$400,000.**

▲ **Mass., Boston**—HOUSING—City of Boston Housing Auth., 10 Post Office Sq., 243 unit, 2 story, row state aided housing, Jamaica Plain. **$2,000,000.**

Mass., Canton—INFIRMARY—Commonwealth of Mass., Dpt. P. Welfare, 600 Washington St., Boston, plans by Mario V. Caputo, 6 Beacon St., Boston, Proj. C-202, infirmary bldg., Hospital School, **$375,000.**

Mass., Greenfield—HOSPITAL—Franklin Co. Hospital, High St., plans by James H. Ritchie & Assoc., 38 Newbury St., Boston, 3 story, brick, steel hospital and nurses home, Sanderson St. **$850,000.** CD 8/17.

Mass., Groton—SCHOOL—Town, Bd. Selectmen, Town Hall, plans by S. W. Haynes, Assocs., 336 Main St., Fitchburg, 2 story, brick, steel school. **$250,000.**

Mass., Hopkinton—SCHOOL—Town, School Bldg. Comn., plans by L. W. Briggs & Co., 90 Park Ave., Worcester, 2 story, brick, Center School Addn. **$300,000.**

Mass., Hopkinton—SCHOOL—Town, John A. O'Brien, chn. School Bldg. Comn., brick, steel high school, Approx. **$250,000.**

Mass., Manchester — SCHOOL — Town, Bd. Selectmen, Town Hall, plans by Coolidge, Shepley Bulfinch & Abbott, 1 Court St., Boston, 2 story, bsmnt., brick, steel school, incl. 1 story wing, gymnasium, auditorium, Lincoln and Summer Sts., **$900,000.** CD 9/4/42.

Mass., Plainville—SCHOOL—Town Bd. Selectmen, Town Hall, plans by Harry J. Korslund, 506 Washington St., Norwood, brick, steel school, incl. gymnasium, cafeteria, **$300,000.** CD 2/25.

Mass., Plymouth—SCHOOL—Town, Bd. Selectmen, Town Hall, plans by J. William Beal Sons, 185 Devonshire St., Boston, brick, steel school, **$250,000.** CD 12/4/46.

▲ **Mass., Roslindale**—HOUSING—City of Boston Housing Auth., 10 Post Office Sq., Boston, 120 unit, 2 story row type state aided housing. **$1,100,000.**

▲ **Mass., Roslindale** — HOUSING — City of Roslindale, Boston Housing Auth., 10 Post Office Sq., Boston, 3 story, 260 unit, state aided housing. **$2,500,000.**

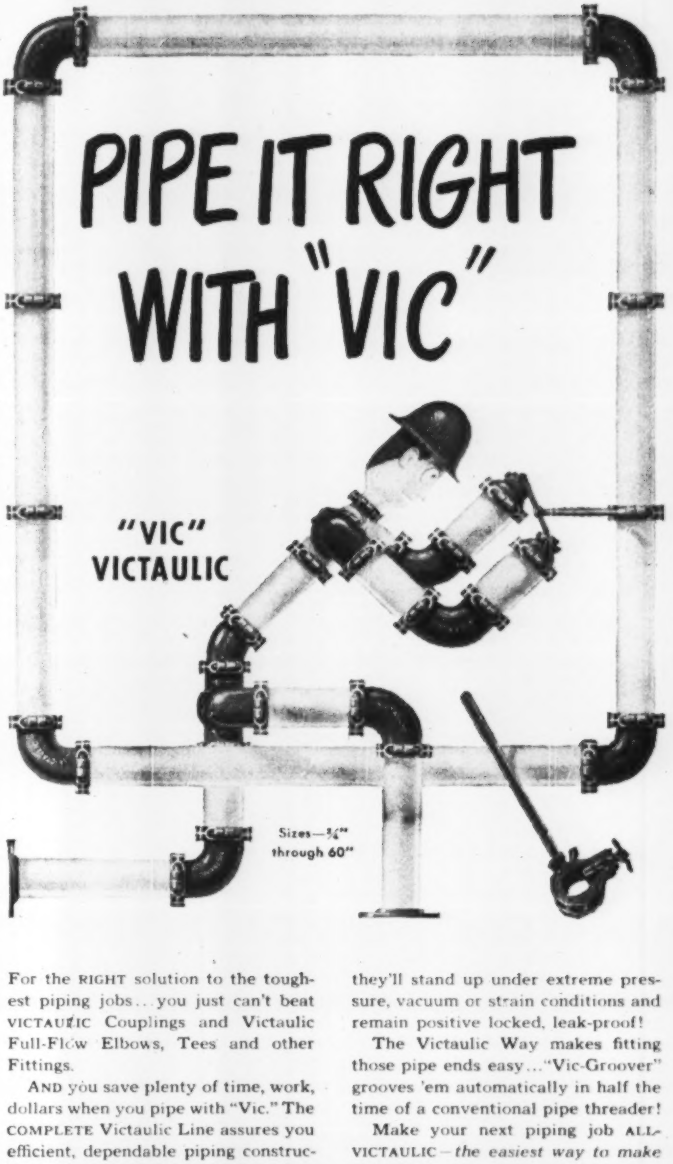
Mass., Taunton—HOME—Commonwealth of Mass., Dpt. Mental Health, 100 Nashua St., Boston, plans by Garland Bilzerian & Edwards, 340 Main St., Worcester, 3 story, bsmnt., brick, steel nurses home. **$250,000.** CD 9/26.

Mass., Woburn—HOUSING—City of Woburn Housing Auth., City Hall, 100 unit housing. Approx. **$900,000.**

Mass., Wrentham—HOSPITAL—Commonwealth of Mass., Dpt. Mental Health, 15 Ashburton Pl., Boston, plans by George S. McLaughlin, 80 Boylston St., Boston, Proj. M-221, hospital at State School, **$400,000.**

▲ **Mich., Birmingham**—HOSPITAL—Oakland Hospital Corp., Birmingham, Oakland Hospital, South Birmingham. Approx. **$3,500,000 $4,000,000.**

▲ **Mich., Van Dyke**—SCHOOL—Warren Twp. Distr. 5, Bd. Educ., plans by Land, Davenport & Meyer, 806 Farwell Bldg., Detroit, masonry, concrete, Lincoln High School. **$1,500,000.**



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Minn., Chisholm—HOUSING—Chisholm Housing & Redevelopment Auth., C. Bestland, secy., plans by Jyring & Jurenes, Hibbing, 70 unit housing. Approx. **$500,000**, CD 2/16.

Minn., Hawley—SCHOOL—Bd. Educ., F. V. Riedberger, clk., plans by Dimond, Haarstick & Lundgren, 416 Endicott Bldg., St. Paul, school addn., alterations, incl. boiler plant. Approx. **$250,000**.

Minn., Slayton—SCHOOL—Bd. Educ., C. E. Anderson, supt., plans by Pass & Rockey, Mankato, school addns. **$270,000**, CD 11/12/45.

Miss., Poplarville—HOSPITAL—Pearl River Co., Poplarville, plans by Krouse & Yarborough, WMOX Bldg., Meridian, hospital. **$325,000**.

Mont., Sunburst—SCHOOL—Toole Co. High School Dist., voted bonds Feb. 21, high school, **$313,623**.

Neb., Kearney—SCHOOLS—Bd. Educ., Kearney, voted **$700,000** bonds Feb. 21, one large school and 2 small schools, Helleberg & Helleberg, Kearney, archts. CD 2/6.

Neb., St. Paul—SCHOOL—Bd. Educ., St. Paul, voted bonds, school. **$275,000**. Helleberg & Helleberg, Kearney, archts. CD 2/7.

N. J., Atlantic City—SCHOOL—Atlantic City Bd. Educ., 1809 Pacific Ave., Senior High School addn. **$400,000**.

▲ **N. M., Albuquerque**—SCHOOLS—Bd. Educ., Albuquerque, voted **$1,100,000** bonds, schools. CD 7/24/46.

N. Y., New York—LIBRARY—Dpt. P. Wks., Municipal Bldg., Zone 7, plans by S. J. Kessler & Sons, 118 E. 28 St., Zone 16, L-9, West Farms Branch Library at Honeywell Ave. near 180 St. **$300,000**. CD 8/31/45.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 63 Park Row, Zone 7, Carver Houses, 1,200 apartments on site bounded by 99 and 106 Sts., Park and Madison Aves., **$18,410,000**; Forest Houses, 1,350 apartments on site bounded by Trinity, Tilton and Union Aves., E. 163, E. 165 and E. 166 Sts. **$17,945,000**. To go ahead in 1950. CD 3/8/48.

▲ **N. Y., Port Washington**—SCHOOLS—Bd. Educ., Union Free School Dist. 1, Town of North Hempstead, Port Washington, plans by Eggers & Higgins, 542 Fifth Ave., New York, Zone 19, Senior High Schol, on 20 acre tract adjacent to present high school, **$2,530,000**; addns. to present Senior High School and conversion to Junior High School, **$475,000**; 3 four room neighborhood schools, **$325,000**; bus garage and administrative office unit, **$100,000**. CD 6/30/47 and CD 6/23/47.

N. C., Astoria—HOUSING—Astoria Housing Auth., Astoria, 115 housing units. Approx. **$500,000**.

N. C., Raleigh—TUBERCULOSIS SANITORIUM—Bd Comrs., Wake Co. John P. Swain, chn., Raleigh, tuberculosis sanatorium addn. **$250,000**.

▲ **N. C., Thomasville**—SCHOOLS—Davidson Co. Bd. Educ., c/o Ralph Wilson, chn. Bd., Thomasville, bond election Apr. 22, schools in county and towns of Thomasville and Lexington, **$3,500,000**.

▲ **O., Alliance**—HOSPITAL—City and Citizens' Hospital Assn., Alliance, voted $150,000 bonds Feb. 28, hospital. **$1,575,000**. CD 1/27.

O., Bath—HIGH SCHOOL—Bath-Richfield Bd. Educ., c/o Wm. A. Spencer, asst. co. prosecutor, Akron, voted $325,000 bonds, 1 story consolidated high school, Everett and Revere Rds., 1 mi. east of Route 21. **$450,000**. CD 2/15.

O., Brilliant—HIGH SCHOOL, etc.—Bd. Educ., Brilliant, voted $320,000 bonds, high school and physical educ. plant. **$865,000**. CD 11/22/48.

O., Canton—UNIVERSITY—City, at special election held Feb. 28, voters defeated special tax levy, Canton University. CD 12/6.

O., Hamilton—UTILITIES SERVICE—City, C. J. Schalm, acting city mgr., Municipal Bldg., plans by Mueller & Hair, Hettrick, Anthony Wayne Hotel, 1 story, 400x400 ft. brick, steel utilities service bldg., garage, office, etc. **$550,000**.

O., London—AUDITORIUM, etc.—London Bd. Educ., London, plans by Claude W. Youst, 55 E. State St., Columbus, 2 story, 90x152 ft., brick, stone connecting corridor, auditorium and gymnasium. **$400,000**.

O., McArthur—SCHOOL—Bd. Educ. McArthur, plans by John Quincy Adams, 35 S. Champion Ave., Columbus, 2 story, brick, stone high school addn. **$230,000**.

O., Rome—GYMNASIUM, etc.—Bd. Educ., Rome, plans by John Quincy Adams, 35 S. Champion Ave., Columbus, 2 story, brick gymnasium and auditorium addn. **$450,000**.

Okla., Ardmore—COURTHOUSE—Carter Co., Ardmore, plans by Harold Flood, Gilbert Bldg., county office, jail and courthouse remodeling. **$270,000**. CD 10/5.

Okla., Norman—INSTITUTE—State Spastic Comn., c/o Jas. B. Moss, 1411 S. Knoxville St., Tulsa, 1 story, 60 bed masonry Palsey Institute. **$307,000**.

Pa., Blain—SCHOOL—Public School Bldg. Auth., 1400 N. Cameron St., Harrisburg, consolidated school for Blain Union School Dist., **$417,960**. W. W. Behrens, c/o owner, ch. engr.

Pa., Clarion—DORMITORY—General State Auth., 18 and Herr Sts., Harrisburg, plans by William C. Young, Standard Life Bldg., Pittsburgh, men's dormitory addn. at Clarion State Teachers College. **$266,000**. A. F. Jones, c/o owner, ch. engr. CD 12/9.

▲ **Pa., Harrisburg**—OFFICE—Dpt. Labor & Industry, Harrisburg, office, 7 and Forster Sts., for the Unemployment Compensation Bureau. **$4,500,000**. CD 5/23/47.

Pa., Lock Haven—DORMITORY—General State Auth., 18 and Herr Sts., Harrisburg, women's dormitory at Lock Haven State Teachers College. **$560,000**. A. F. Jones, c/o owner, ch. engr.

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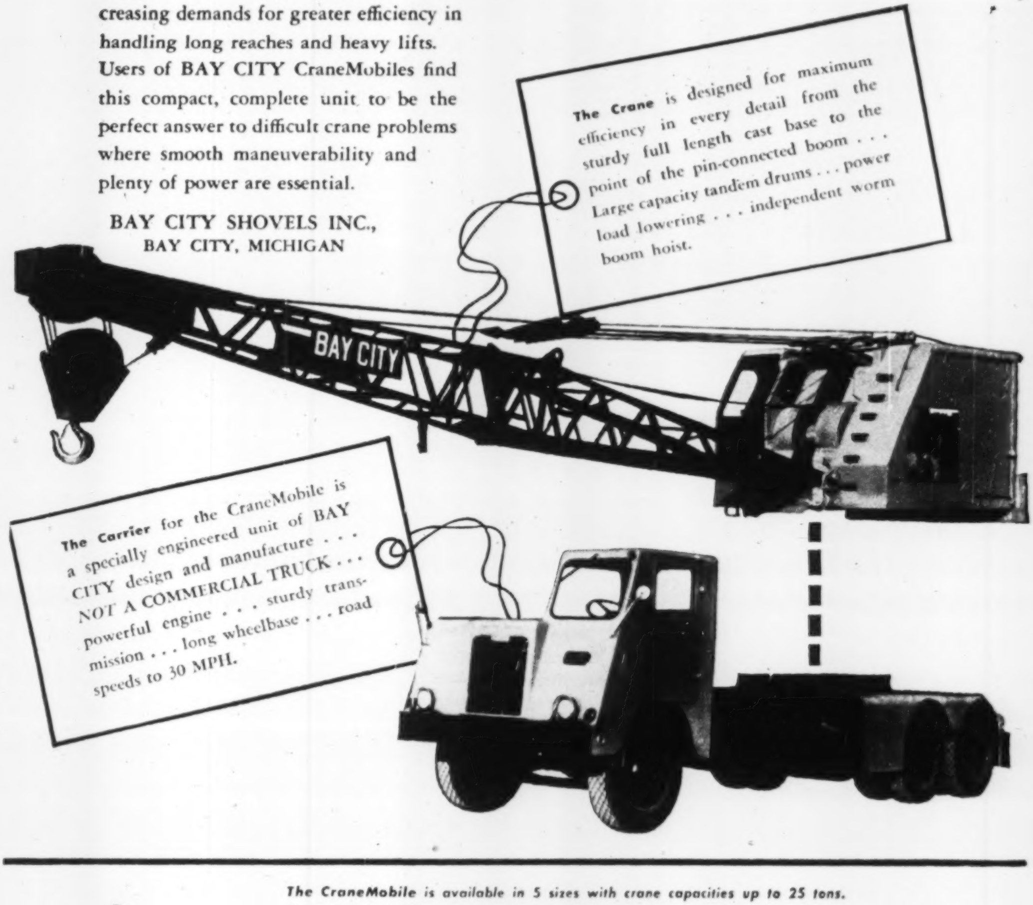

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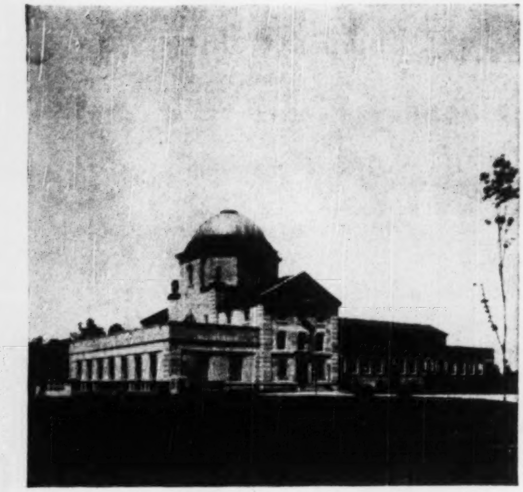
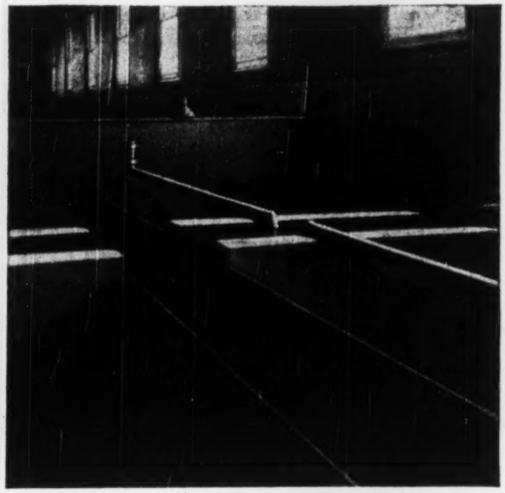


West Pumping Station and Filtration Plant, Bureau of Water, Erie, Pa.



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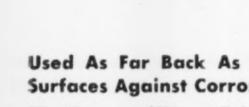
Further Information Available—Metallizing may help solve your corrosion problems. For further information, or the name of your nearest metallizing contractor, write:



FREE BULLETIN. Bulletin 62—"Stop Corrosion with Metallizing" pictures many different types of jobs, such as bridges, structural steel, barges, dam gates; includes spray test and life expectancy charts.

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(Continued from page 290)

Pa., Lock Haven—DORMITORIES, etc.—General State Auth., 18 and Herr Sts., Harrisburg, project abandoned, renovation of men's and women's dormitories and administration bldg. at Lock Haven State Teachers College. **$336,000.** George M. D. Lewis, 445 Kressler Court, Scranton, Zone 10, archt. A. F. Jones, c/o owner, ch. engr. CD 12/23.

Pa., Mansfield—KITCHEN—General State Auth., 18 and Herr Sts., Harrisburg, reconstr. kitchen at Mansfield State Teachers College. **$250,000.** A. F. Jones, c/o owner, ch. engr.

Pa., Northeast—SCHOOL—School Dist. Northeast Twp. Northeast, plans by Wm. Holmes Crosby, Box 603, Oil City, 2 story 130x164 ft. brick, tile memorial grade school addn. **$250,000.**

▲ **Pa., Phila.**—PSYCHIATRIC INSTITUTE—Pennsylvania General State Auth., Harrisburg, plans by Davis & Poole, 112 S. 16 St., Eastern Pennsylvania Psychiatric Institute. **$6,000,000.** Horace B. Nicholson, Broad St. Station Bldg., consult. engr. CD 12/8.

▲ **Pa., Phila.**—HOUSING—Phila. Housing Auth., 21 and Winters Sts., plans by McAllister & Braik, Bulletin Bldg., and Louis I. Kahn & Kenneth M. Day, 1728 Spruce St., low rent housing development, Juniata Area, Hunting Park Ave., Cayuga St., etc. **$4,800,000;** plans by Wigham & Tilden, 1601 Chestnut St., housing development, Diamond area, 22 and 25 Sts., etc. **$5,600,000;** plans by Oscar G. Stonorov, Broad St. Station Bldg., Rittenhouse area, Pulaski Ave. and Rittenhouse St., **$1,600,000;** plans by W. Pope Barney & Roy W. Banwell, Girard Trust Bldg., housing development, Girard Area, Porter St., Oregon Ave. etc. **$4,000,000.** CD 9/12.

Pa., Punxsutawney—BARRACKS—General State Auth., 18 and Herr Sts., Harrisburg, barracks bldg., garage and driver examination course for Penna. State Police. **$300,000.** A. F. Jones, c/o owner, ch. engr.

Pa., Retreat—BOILER PLANT—General State Auth., 18 and Herr Sts., Harrisburg, boiler plant addns. at Retreat State Hospital. **$353,982.** Mark Krause, Williamsport, consult. engr. A. F. Jones, c/o owner, ch. engr. CD 1/23.

Pa., Willow Grove — SCHOOL — Upper Moreland Twp. School Bd., Willow Grove, school, Division and Woodlawn Sts. Approx. **$250,000.** CD 11/1/45.

R. I., Bristol—MEMORIAL—Town, c/o J. F. Xavier, secy. Veterans Comn., 615 Wood St., plans by Albert Harkness & Peter Geddes, 726 Industrial Trust Bldg., Providence, brick, steel memorial bldg., incl. auditorium. **$500,000.** CD 12/20.

▲ **R. I., Providence**—HOUSING—Providence Housing Auth., 263 Chad Brown St., frame garden apartments, 1,520 family units. **$11,000,000.**

▲ **S. D., Sioux Falls**—AUDITORIUM-ARENA—City, City Hall, 9 and Dakota Sts., bond election April 18, auditorium arena. **$1,500,000.**

▲ **Tenn., Knoxville**—HOUSING—Knoxville Housing Auth., 1701 Jourolmon St., plans by Bealer & Wilhoit, Mercantile Bldg., 200 housing units for Negroes. Proj. 1. **$1,400,000.**

Tenn., Pulaski—HOUSING—Pulaski Housing Auth., Pulaski, housing units. **$350,000.**

Tex., Armarillo—SCHOOL—Amarillo Independent School Dist., Amarillo, plans by Emmett F. and James F. Rittenberry, Fisk Bldg., Junior High School. **$650,000.** CD 4/15/47.

Tex., Andrews—SCHOOL, etc.—Andrews Independent School Dist., Andrews, voted bonds, gymnasium, vocational, classroom, Junior High School addn. **$250,000;** school, **$250,000.** Guy Carlander, Box 3158, Amarillo, archt. CD 2/23.

Tex., Austin—SCHOOL—Austin Independent School Dist., Austin, plans by Jessen, Jessen, Millhouse & Greeven, 112 E. 9 St., masonry type Campbell and Rosewood School addns. **$250,000.** CD 7/21.

▲ **Tex., Breckenridge**—HOUSING—Breckenridge Housing Auth., Breckenridge, 75 low-rental housing units, **$532,500;** 2nd proj., 75 low-cost rental housing units, **$532,500.**

Tex., Bridgeport—HOUSING—Bridgeport Housing Auth., E. W. Jones, exec. secy., Bridgeport, 100 housing units. **$825,000.**

Tex., Corpus Christi—AUDITORIUM, etc.—Corpus Christi Independent School Dist., Corpus Christi, plans by Brock & Anderson, Jones Bldg., auditorium and classroom for Del Mar College. **$500,000.** Matthews & Kenan, Transit Tower, San Antonio, consult. engrs. CD 8/1.

Tex., Corsicana—MAIN and SCIENCE—Navarro Junior College, Corsicana, plans by W. G. Clarkson, 610 First Natl. Bank Bldg., main bldg., **$300,000;** science and rehabilitation, **$250,000.** CD 9/29.

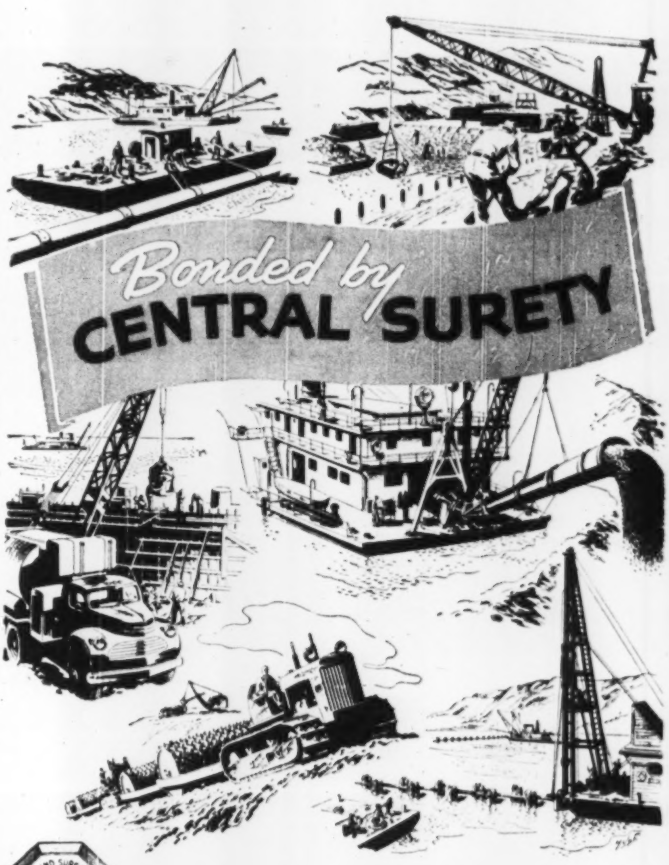
Tex., Dalhart—JUNIOR HIGH SCHOOL—Dalhart Independent School Dist., Dalhart, plans by Emmett F. & James F. Rittenberry, Fisk Bldg., Amarillo, Unit 1, Junior High School. **$250,000.** CD 7/26.

Tex., Edna—ARMORY, etc.—Texas National Guard, Austin, armory, recreation center, playgrounds, incl. motor-maintenance shop. **$275,000.**

▲ **Tex., Electra** — HOUSING — Electra Housing Auth., Electra, 150 housing units. **$1,087,500.**

Tex., Liberty — HIGH SCHOOL — Liberty Independent School Dist., Liberty, high school. **$500,000.** CD 3/27/47.

▲ **Tex., Galveston**—SCHOOLS—Galveston Public Schools, c/o Bd. Trustees, Alamo 5200N½ St., bond election Apr. 1, high school, north of Avenue 1, **$1,650,000;** high school off Avenue O, Lasker Park, Ave P½, **$2,350,000.** Preston M. Geren, Neil P. Anderson Bldg., Fort Worth, archt. R. R. Rapp, Guaranty Bldg., consult. archt.



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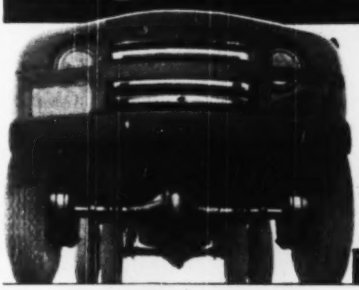

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Tex., Ganado—HIGH SCHOOL, etc.—Ganado Independent School Dist., Ganado, voted bonds, high school and stadium. **$250,000.** CD 1/20.

Tex., Haskell—HOUSING—Haskell Housing Auth., Haskell, 50 units low rental housing units, **$362 500.** CD 1/23.

Tex., Hearne—LIGHT PLANT—City, voted bonds, electric light plant remodeling, addn., **$110,000.** CD 1/19.

Tex., Hearne—HOUSING—Hearne Housing Auth., Hearne, 40 housing units, **$300,000.**

Tex., Omaha—SCHOOL—Omaha and Naples Consolidated School Dist., Omaha, public school. **$300,000.**

Tex., Palestine—HOUSING—Palestine Housing Auth., Palestine, plans by C. L. Hazelwood, 14 Link Bldg., 125 low-rental housing units. **$850,000.** CD 2/2.

▲ **Tex., Quanah** — HOUSING — Quanah Housing Auth., Quanah, 150 housing units, **$1,087,500.**

Tex., Silsbee—HOSPITAL—Hardin Co., F. Richardson, judge, Kountze, voted bonds, 50-bed hospital. **$450,000.** CD 1/9.

Tex., Smithville—HOSPITAL—Smithville Hospital Bd., c/o W. E. Beal, chn., Smithville, hospital. Approx. **$250,000.**

Tex., Waco—GYMNASIUM—Waco Independent School Dist., Waco, 2 high school gymnasiums, **$350,000.**

Vt., Castleton—SCHOOL—Town supt. Schools, Castleton, plans by Helmer & Cole, Pleasant St., Woodstock, school. **$400,000.**

Wash., Arlington — SCHOOL — School Bd., Arlington, school, **$350,000.**

Wash., Epharata—HOUSING—Ephrata Housing Auth., Ephrata, 50 housing units, **$400,000.**

Wash., Grand Coulee—HOUSING—Grand Coulee Housing Auth., Grand Coulee, 100 housing units, **$800,000.**

Wash., Kennewick—HOUSING—Kennewick Housing Auth., Kennewick, 75 housing units, **$600,000.**

Wash., Lowell—SCHOOL—School Bd., Lowell, plans by W. A. Johnson, First Natl. Bank Bldg., Everett, 1 story, masonry school, **$400,000.**

Wash., Moses Lake—SCHOOL—School Bd., Moses Lake, plans by H. A. Hovind, 1500 W. Westlake Ave. N., Seattle, school. **$450,000.** CD 2/2/48.

Wash., Soap Lake—HOUSING—Soap Lake Housing Auth., Soap Lake, 50 housing units. **$400,000.**

Wash., Wenatchee — JUNIOR COLLEGE — School Bd., Wenatchee, plans by Naramore, Bain, Brady & Johanson, Dexter Horton Bldg., Seattle, Zone 4, Junior College. **$300,000.** CD 2/21/45.

Wash., Yakima—SCHOOL—School Bd., Yakima, Washington Junior High School addn. **$257,000.**

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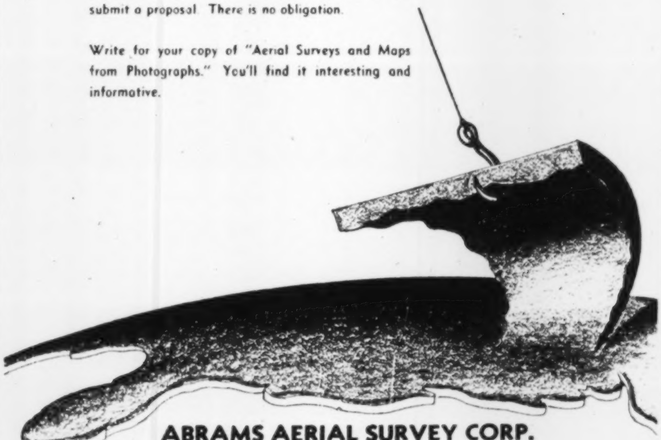

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Wis., Algoma—HOSPITAL—City plans by Foeller, Schober, Berners, Safford & Jahn, 310 Pine St., Green Bay, 2 story, bsmnt. hospital, **$400,000.**

▲ **Wis., Milwaukee**—HOUSING—City of Milwaukee Housing Auth., 844 N. Market St., plans by R. E. Schaefer, Geo G. Schneider, F. J. Schweitzer & W. M. Trapp, c/o owner, housing, incl. 724 units in area of south of W. Silver Spring Dr. between N. 60 and N. 68 Sts. **$6,000,000.**

Alaska, Anchorage—WAREHOUSE, etc.—City, City Hall, masonry warehouse, **$250,000;** rein.-con. repair shop and storage sheds, **$279,100.** C. Ryck, city engr. CD 8/5/46.

▲ **Alaska, College**—MEMORIAL, etc.—University of Alaska, College, plans by Foss & Malcolm, Goldstein Bldg., Juneau, memorial bldg., **$327,000;** student union, **$522,500;** dormitory, **$480,000.**

Alaska, College—MINES, etc.—University of Alaska, College, plans by Foss & Malcolm, Goldstein Bldg., Juneau, 3 story, rein.-con. mines bldg., **$525,000;** 1 story, rein.-con. infirmary, **$157,500.** CD 12/23/46.

Alaska, Dillingham—SCHOOL—School Bd. plans by Taylor & Kilpatrick, 4th Ave. Bldg. Anchorage, enlarge, remodel school. **$258,000.** CD 2/13.

Alaska, Fairbanks—SCHOOL—School Dist., Fairbanks, plans by Alaska Architectural & Eng. Co., Box A-509, rein.-con. school, General Services Admin. Proj. 50-A-3, **$365,000.** CD 7/9/48.

▲ **Alaska, Fairbanks**—SCHOOL—School Bd., Fairbanks, plans by Mayer & Manley, Loussac Sign Bldg., Anchorage, school, **$2,250,000.** CD 7/9/48.

Alaska, Juneau—MUNICIPAL—City, City Hall, Juneau, plans by Foss & Malcolm, Goldstein Bldg., municipal bldg. **$450,000.** CD 5/13/45.

Alaska, Juneau—SCHOOL—School Bd., Juneau, plans by Foss, Malcolm & Olsen, Juneau, school. **$400,000.** CD 12/21.

Alaska, Klawock—SCHOOL—School Bd., Klawock, plans by Foss & Malcolm, Goldstein Bldg., Juneau school, **$384,000.** CD 2/8.

Alaska, Petersburg—HOSPITAL—Town, Town Hall, plans by Foss & Malcolm, Goldstein Bldg., Juneau, hospital, **$400,000.**

Alaska, Sitka—HOSPITAL—City, City Hall, plans by Foss & Malcolm, Goldstein Bldg., Juneau, hospital, **$800,000.**

†**Eniwetok Atoll**—HOUSING—U. S. Eng., First and Douglas Sts., and Atomic Energy Comn., 191 Constitution Ave. N.W., Wash., D. C., semi-permanent housing, utilities and communications. Holmes & Narver, 824 S. Figueroa St., Los Angeles, Calif., engrs.

Man., St. James—COLLEGIATE—School Bd., St. James, plans by J. N. Semmens, 348 Main St., Winnipeg, collegiate, **$450,000.**

Ont., Blenheim—SCHOOL—Public School Bd., Blenheim, plans by C. H. Gillin, 284 Dundas St., London, 1 story, concrete, steel, brick school. **$280,000.**

Ont., Etobicoke—INSTITUTE—Bd. Educ., D. L. Emond, secy., plans by Page & Steele, 72 St. Clair Ave. W., Toronto, collegiate institute addn. Approx. **$450,000.**

Ont., Islington—COLLEGIATE—Bd. Educ., Islington, plans by Page & Steele, 72 St. Clair St., W. Toronto, 12 classroom collegiate addn., etc. **$450,000.**

Ont., Oshawa—POST OFFICE—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, plans by G. Brault, c/o owner, public bldg. post office and offices. Approx. **$250,000.**

▲ **Ont., Ottawa**—PUBLIC—Acting Secy. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., plans by G. Brault, c/o owner and Ross, Patterson, Townsend & Heughan, 1010 St. Catherine St. W., Montreal, Que., public bldg. for Bureau of Statistics on Tommeys Pasture site west end of city. Approx. **$2,500,000.**

Ont., Ottawa—MACHINE SHOP—Government of Canada Dpt. Mines & Technical Surveys, Ottawa, machine shop extens. and stores bldg. **$450,000.**

▲ **Ont., Rockcliffe (near Ottawa)**—HOUSES—Central Mortgage & Housing Corp., Ottawa, Ont., addnl. 300 houses at Air Force Station. Approx. **$2,100,000.**

Ont., Toronto—SCHOOL—First Township School Area, North York, H. M. Brownless, secy., plans by P. A. Deacon, 1016 Eglinton Ave. W., 10 room Humberlea School near old Weston Rd. and Wilson Ave. Approx. **$275,000.** CD 12/15/43.

Ont., Toronto—SCHOOLS—Toronto and Suburban Separate School Bd., 477 Jarvis St., school for St. John's Parish on Kingston Rd., **$250,000;** school for Canadian Martyrs Parish on O'Connor Dr., **$250,000.**

Que., Dolbeau—HOSPITAL—Municipality in co-operation with Lake St. John Power & Paper Co., Ltd., Dolbeau, hospital. **$250,000.**

Que., Magog—SCHOOL—School Comn., O. Bergeron, secy., plans by J. Aime & A. Poulin, 71 Prospect St., Sherbrooke, 12 classroom school in Parish of St. Jeam Basco. Approx. **$274,000.**

Que., Richmond—HOME—Wales Home for Protestant Old People. Dr. E. C. Manning, secy., plans by McDougall, Smith & Fleming, 1235 McGill College Ave., Montreal, home for aged, near here. Approx. **$600,000.**

Que., Rimouski—PUBLIC—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., plans by G. Brault, c/o owner, public bldg., post office, etc. Approx. **$450,000.**

Sask., Regina—PUBLIC—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., plans by G. Brault, c/o owner, public bldg. for Taxation Division of Dpt. National Revenue. Approx. **$300,000.**

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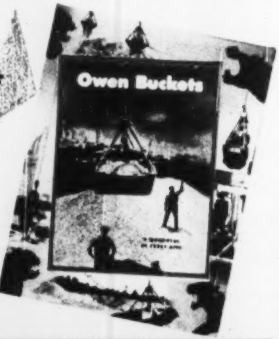

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▲ **Ala., Montgomery** — APARTMENT HOTEL — Aronov Bros., & W. B. Smith, c/o Sherlock, Smith & Adams, archts., 301 Washington St., apartment hotel, **$1,000,000.**

▲ **Calif., Beverly Hills**—HOTEL—The Crumner Corp., 523 W. 6 St., plans by Wurdeman & Becket, 3757 Wilshire Blvd., Los Angeles, 7 story, 500 room hotel to be known at Beverly Hilton, Wilshire and Santa Monica Blvds. **$11,000,000,** incl. land, etc.

Calif., Pasadena — PARISH—Pasadena Presbyterian Church, c/o Soule & Murphy, archts., 116 E. Sola St., Santa Barbara, 3 story, 49,000 sq. ft., rein.-con. parish bldg., Madison and Colorado Sts. Approx. **$250,000.**

Calif., Santa Rosa—LODGE—Odd Fellows Lodge, 426 Mendocino Ave., plans by C. A. Caulkins, Jr., Roseberg Bldg., 2 story lodge, **$250,000.**

Conn., Deep River—HOUSING—Samuel Sbona, 23 Winter Ave., erecting single frame houses on 6 acre tract Village and Bridge Sts. **$250,000.**

Conn., Glastonbury—HOUSING—John A. Carini, South Glastonbury, plans by Malloy & Mozzochi, 343 New London Turnpike, 50 single frame houses 45 acre development, Neipsic Rd. **$500,000.**

▲ **Conn., Milford**—HOUSING—Stewart Burklane, c/o Sullivan W. Jones Assoc., archts., 110 E. 42 St., New York, N. Y., 120 houses 30 acre Beach Property, New Haven and Seabreeze Aves. **$1,000,000.**

Conn., Norwich—BUSINESS—Annlar Assoc., Lazarus Heymar, pres., Main St., Danbury, 1 story, 40,000 sq. ft., brick, steel business bldg., Main and Franklin St. **$300,000.**

Conn., Ridgefield — HOUSING—Lawrence M. Samuel, Main St., single frame houses, 220 acre Rundle Farm, Ridgebury Sect., Approx. **$250,000.**

Conn., Wethersfield—HOUSING—Louis Mitnick Co., 1305 Main St., Hartford, 67 houses, Nott St. and Cedar St. Sect., Timber Village, about 70 acres. **$650,000.**

Fla., Miami Beach—HOTEL—J. Browier, c/o B. Robert Swartburg, 126 24 St., hotel. Approx. **$250,000.**

Fla., Miami Beach—HOTEL—Calvert Hotel, c/o Albert Anis, archt., 420 Lincoln Rd., Pent House, Miami Beach, hotel, Approx. **$250,000.**

Fla., St. Petersburg—APARTMENT UNITS—Tropical Shores Apartments, c/o Wm. O. Sparklin, 424 MacDill Ave., Tampa, 48 apartment units. Approx. **$250,000.**

Ga., Milledgeville—CHURCH—First Baptist Church, c/o Hal W. Greer, 29 W. Andres Dr. N. W., Atlanta, Church. **$250,000.**

Idaho, Idaho Falls—HOUSING—A. W. Brunt, 691 Park Ave., 72 houses, **$720,000.**

Idaho, Idaho Falls—HOUSING—Triangle Constr. Co., 906 E. 14 St., 80 houses, **$800,000.**

Ill., Alton—CHURCH—First Baptist Church, Alton, plans by P. John Hoener, 3415 S. Kingshighway, St. Louis, 9, Mo., rein.-con., brick, stone church, tower, chapel and sunday school. **$250,000.**

Ill., River Forest—APARTMENT—Mon-Nor Bldg. Corp., c/o P. J. Bruns, 4734 N. Hermitage, Chicago, Zone 40, 3 story, 43 unit, rein.-con., brick apartment, North and Monroe Sts., **$250,000.**

Ind., Gary—HOSPITAL—Methodist Hospital, 1600 W. 6 St., plans by Beine, Hall & Curran, 607 Broadway, 4 and 5 story, hospital addn. $250,000. CD 1/31/44.

Ia., Council Bluffs—TEMPLE—Masonic Lodge, 4 and Broadway, plans by R. C. Robinson, 106 S. Main St., 3 story masonic temple. **$250,000.**

Kan., Topeka—OFFICE—Owner, c/o Stockey & Howells, Insurance Bldg., office. **$250,000.**

Kan., Wellington—CHURCH—First Methodist Church, Wellington, plans by Schmidt, McVay & Peddie, 1832 E. 2 St., Wichita, church addn. **$250,000.**

▲ **Kan., Wichita**—APARTMENT—Builders, Inc., Derby Bldg., plans by George Metz & Robert Morris, Derby Bldg., apartment, 2 and Topeka Sts. **$1,000,000.**

▲ **Ky., Lexington**—HOTEL—Main St. Properties, Inc., 120 E. Main St., plans by Frankel & Curtis, 163 W. Short St., 3 story and 7 story wing 170x260 ft. addns. to Phoenix Hotel, and 250-car garage. **$1,500,000.**

Ky., Louisville—SUNDAY SCHOOL—Highland Baptist Church, Cherokee Rd. and Grinstead Dr., plans by Southern Baptist Assn., 125-9 Ave. N., Nashville, Tenn., 3 story, bsmnt., 50x175 ft., brick, Sunday School addn. **$250,000.**

La., Baton Rouge—THEATRE—Don Theater, c/o Herbert Wimberly, 5446 Goodwood Ave., theater. **$500,000.**

La., New Orleans—OFFICE—The Memorial Hospital, Inc., c/o Frevert & Wolf, archts., 630 Gravier St., doctor's office bldg., Approx. **$250,000.**

La., New Orleans—DORMITORY—Newcomb College, c/o Richard Koch, archt., Queen & Crescent Bldg., women's dormitory. Approx. **$250,000.**

Me., Fort Kent—HOSPITAL—Fort Kent Hospital, Fort Kent, plans by Edward T. P. Graham, 171 Newbury St., Boston, Mass., 2 story, bsmnt., brick, steel hospital, **$525,000.**

Md., Baltimore—SCHOOL—Maryland School for the Blind, c/o James R. Edmunds, Jr., archt., 103 W. Hamilton St., 1 story, part bsmnt., brick gymnasium; 2 story, bsmnt., brick classroom bldg., **$350,000.** Frederick S. Cates, 103 W. Hamilton St., assoc. archt.

Mass., Andover—LIBERAL ARTS UNIT—Merrimack College, Rev. Vincent A. McQuade, pres., Andover, plans by Joseph G. McGann, 129 Newbury St., Boston, 3 story, bsmnt., brick, stone liberal arts unit. $350,000.

Mass., Brookline—APARTMENT—Owner c/o Feer & Nast, archts., 27 School St., Boston, 6 story, bsmnt., 80x175 ft., brick, steel, 53 unit, apartment house, Brookline Ave., $350,000.

Mass., Springfield—DORMITORY—Springfield College, P. M. Lambert, pres., 263 Alden St., sketches by Collens, Willis & Beckonert, 20 Newbury St., Boston, 3 story, brick, steel womens dormitory, campus, $250,000.

Mass., Taunton—SCHOOL—Sacred Heart R. C. Parish, Francis McKeon, pastor, c/o Fall River Diocese, Highland Ave., Fall River, brick, steel parochial school, Fay St. $250,000.

Mass., Taunton—SCHOOL—St. Joseph's R. C. Parish, Edmund J. Ward, pastor, c/o Fall River Diocese, Highland Ave., Fall River, brick, steel parochial school, Sheridan St. $250,000.

Mass., Worcester—STORE—W. T. Grant Co., 1441 Broadway, New York, N. Y., plans by Leland & Larson, 814 Statler Bldg., Boston, 2 story, brick, steel store, Main St. $800,000.

▲ **Mich., Detroit**—HOSPITAL—Henry Ford Hospital, West Grand Blvd. at Hamilton St., plans by Voorhees, Walker, Foley & Smith, 101 Park Ave., New York, N. Y., 17 story, 104x266 ft., steel, brick, limestone or marble, rein.-con., air-conditioned hospital addn., incl. 20 ft. raised therapeutic swimming pool. Approx. $12,000,000.

Minn., Winona—CATHEDRAL etc.—R. C. Diocese of Winona, Bishop E. A. Fitzgerald, Winona, plans by J. J. Flad & Assocs., 113 Langdon St., Madison, Wis., cathedral, $750,000, 3 story, bsmnt., 56x154 ft. dormitory $250,000 with 30x60 ft. chapel at St. Marys College. CD 1/26/44.

Miss., Natchez—HOTEL—K. R. Ewald, Jr., and A. C. Lewis, Jr., Natchez, hotel. Approx. $250,000.

▲ **Mo., University City (St. Louis 5, P.O.)**—HOUSING—Canterbury Gardens, Inc., c/o Joseph H. Kanter of Warner & Kanter, Empire Bldg., Birmingham, Ala., plans by Gay G. Weinel, 3837 West Pine Blvd., St. Louis, Zone 8, 896 unit multiple-dwelling housing on 59 acre site west of McKnight Rd. and north of proposed exten. of Delmar Blvd., adjacent to Old Bonhomme Rd. $9,000,000.

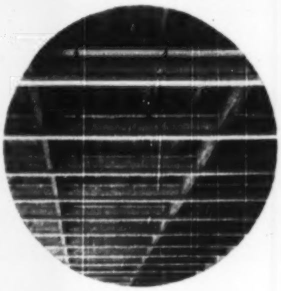
Mont., Livingston—HOSPITAL—Livingston Hospital Assn., Livingston, plans by Cushing & Terrell, Billings, hospital, $550,000. CD 11/24/47.

Neb., Hastings—DORMITORY—Hasting College, Hastings, plans by Davis & Wilson, 225 Stuart Bldg., Lincoln, men's dormitory. $275,000. CD 2/15.

Neb., Omaha—SCHOOL—Beth-El Synagogue, 49 Ave. and Farnam St., plans by N. S. Wallace, Omaha Natl. Bank Bldg., school. $250,000.

Neb., Omaha—HOUSING—Golden Valley Co-operative Assn., Omaha, approx. 40 dwellings, near here. $350,000.

(Continued on page 299)



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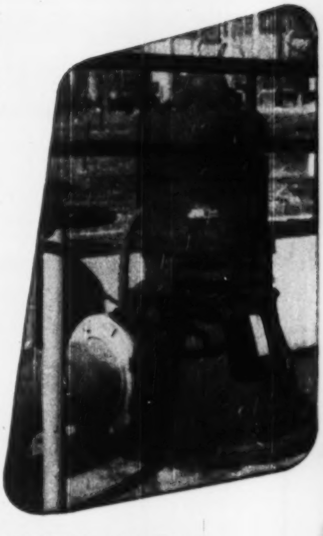

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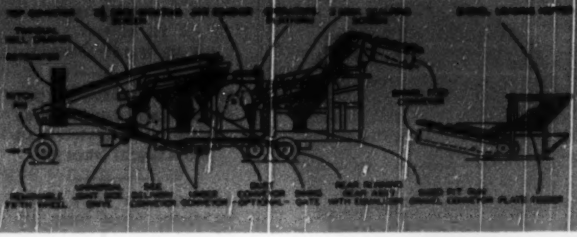

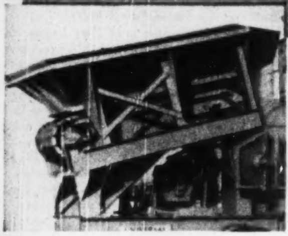

This apron feeder replaces scalping screen for quarry rock.

Gravel pits containing large rock are no longer a problem. Because the jaw crusher is much larger, the 293-QS takes oversize rock ordinarily rejected. Universal Engineers took the famous Universal 293-Q TwinDual Pacemaker quarry plant, removed the apron feeder, and installed a scalping screen. This screen scalps pit oversize to the primary jaw crusher and screens out sand and gravel not requiring crushing. Material requiring secondary crushing is by-passed to TwinDual Rolls.

100% chips can be produced, or finished material from the scalping screen blended with crushed material from the plant. This flexible high production gravel plant can be converted in the field to quarry operation when the situation demands. One investment provides a plant that really meets today's demands and tomorrow's changing needs. It has many other features you should know. Write for complete details.

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(Continued from page 297)

▲ **N. J., Jersey City**—HOUSING—Naraoma Corp., c/o Kelly & Gruzen, archts., 80 Fifth Ave., New York 3, N. Y., housing on 22 acre site bounded by Westside Ave., Boardman Parkway and Audubon Ave. **$4,000,000.**

N. Y., Brooklyn—CHURCH, etc.—Roman Catholic Church of the Holy Family, 9701 Flatlands Ave., Zone 12, plans by George J. Sole, 110 E. 42 St., New York, Zone 17, 1 story church, 2 story parochial school at premises. **$500,000.**

▲ **N. Y., Elmhurst**—APARTMENT—Woodbriar Manor, Inc., c/o Julius Fishkind, archt., 141 Broadway, New York, Zone 6, 6 story apartments at Denman St., northwest corner of and southwest corner of Elmhurst Ave., **$568,000** and **$977,000** respectively; Elbertson St., northwest corner of Britton Ave., **$685,000**; Elbertson St., northeast corner of Elmhurst Ave., **$488,000**; Denman St., southeast and northeast corner of Elmhurst Ave., **$543,000** and **$713,000** respectively.

N. Y., Brooklyn—APARTMENT—Barlut Building Corp., 782 E. 93 St., Zone 12, plans by Seelig & Finkelstein, 153 Pierrepont St., Zone 2, 6 story apartment, 502-534 E. 21 St. **$775,000.**

N. Y., Brooklyn—APARTMENTS—Garon Realty Corp., 625 Ocean Ave., plans by Sohn & Weston, 44 Court St., Zone 2, 6 story apartment, 18-32 Woodruff Ave. **$344,000**; 6 story apartment, 27-37 Crooke Ave. **$276,000.**

N. Y., Brooklyn—APARTMENT—Park Carroll Corp., 26 Court St., Zone 2, plans by A. Rollin Caughey & Rollin A. Caughey, 165 E. 73 St., New York, Zone 21, 8 story apartment, 130 8 Ave. **$360,000.**

N. Y., Brooklyn—HOUSES—Petval Realty Corp., 8509 Third Ave., Zone 9, plans by Kitzler & Murick, 66 Court St., Zone 2, 23 two-story, two-family houses, 245-79 68 St. and 246-66 Senator St. **$414,000.**

N. Y., Brooklyn—APARTMENT—Roder Realty Corp., 16 Court St., Zone 2, plans by Kavy & Kavovitt, Inc., 44 Court St., Zone 2, 6 story apartment, 814-30 E. 9 St. **$588,000.**

N. Y., New York—CONVENT, etc.—Convent of Mary Reparatrix Inc., 14 E. 3 St., Zone 3, plans by Paul C. Reilly, 111 Fifth Ave., Zone 3, convent and retreatants house, 7-13 E. 28 St. and 8-16 E. 29 St. **$745,000.**

N. Y., New York—TELEPHONE EXCHANGE—New York Telephone Co., 140 W. St., Zone 7, plans by Voorhees, Walker, Foley & Smith, 101 Park Ave., Zone 17, telephone exchange bldg. alterations, 151 E. 97 St. **$475,000.**

N. Y., New York—APARTMENT—Walton Gardens Corp., 400 E. Fordham Rd., Zone 58, plans by Herbert Lillien, 201 W. 72 St., Zone 23, 6 story apartment, Walton Ave. north of 183 St. **$450,000.**

N. Y., Rego Park — APARTMENT—Queens Midtown Apartments, Inc., c/o S. J. Kessler, archt., 118 E. 28 St., New York, Zone 16, 6 story apartment, Queens Blvd. and 62 Ave. **$553,000.**

▲ **N. C., Asheville**—HOSPITAL—Memorial Mission Hospital, c/o Six Associates, Inc., archt., 15 Church St., hospital. **$2,625,250.**

N. C., Charlotte—CHURCH, etc.—Christ Episcopal Church, Rev. Henry H. Rightor, rector, 1412 Providence St., church and parish house, Providence Rd., Beverly Dr. and Hampton Ave. Approx. **$250,000.** CD 5/22/44.

N. D., Williston—HOTEL—Williston Hotel Co., Williston, plans by Design, Inc., 906 Sidney St., St. Louis, Mo., hotel. **$640,000.** CD 8/19.

O., Mansfield—HOTEL—Richland Hotel Co., Mansfield, 100-rooms or more addn., enlarge coffee shop and cocktail room at Mansfield-Leland Hotel.

O., Middletown—DEPARTMENT STORE—Denton, Inc., 14 Main St., Springfield, plans by Zeller-Hunter, 17½ S. Center St., Springfield, and Harold Goetz (assoc. archt.) N. Main St., 3 story, bsmnt., 96x150 ft, brick department store. **$500,000.** CD 9/10/48.

▲ **O., Toledo**—HOUSING—Irwin Fruchtman, c/o Maumee Malleable Castings Co., Woodville & W. L. E. Belt Ry., Toledo, and Bert L. Smokler & Co., 10600 St. Martins St., Detroit, Mich., 400 unit garden-type housing on 34-acre site on north side of W. Central Ave., between Pemberton an Middlesex Dr. **$4,000,000-$5,000,000.**

Okla., Oklahoma City—EDUCATION—First Presbyterian Church, 9 and Robinson Sts., plans by Parr & Aderbold, Hales Bldg., religious educ. bldg. **$250,000.**

Okla., Tulsa—SHOPPING CENTER—Utica Square, c/o Dale Carter & Don Nix, Mayo Bldg., plans by J. O. Lambert Assoc., Inc., 2204 Cedar Springs St., Dallas, Tex., shopping center. **$500,000.**

Ore., Roseburg—LODGE—Roseburg Aerie, Fraternal Order of Eagles, Roseburg, plans by Warren Weber, Fenton Bldg., Portland, 5 story, rein.-con. structure housing lodge halls and store space. **$500,000.**

Pa., Camp Hill—HOSPITAL—West Shore Community Hospital, 1501 N. 2. St., Harrisburg, plans by Chatfield & Schlicker, 314 W. Chelten Ave., Phila., hospital. **$500,000.**

▲ **Pa., Elkins Park**—RESIDENCES, etc.—Irving G. Schorsch, Erie Ave. at 17 St., Phila., 36 residences and apartment alterations, **$2,000,000.**

Pa., Jenkintown—OFFICE—Fine Arts Sterling Silver Co., 12 S. 12 St., Phila., plans by The Ballinger Co., 121 N. Broad St., Phila., office. **$250,000.**

▲ **Pa., Lemoyne**—HOUSING—William Hollinger, Dauphin Bldg., Harrisburg, residential housing along Lowther St., development of McCormick Farm area, **$1,000,000.**

(Continued on page 301)

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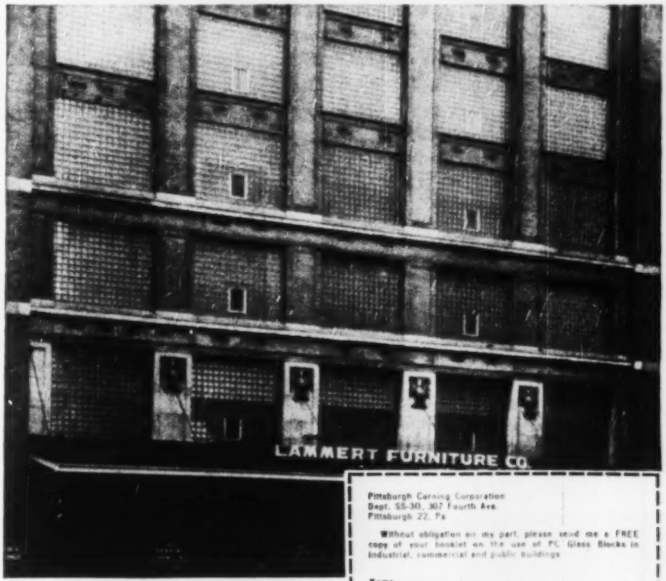

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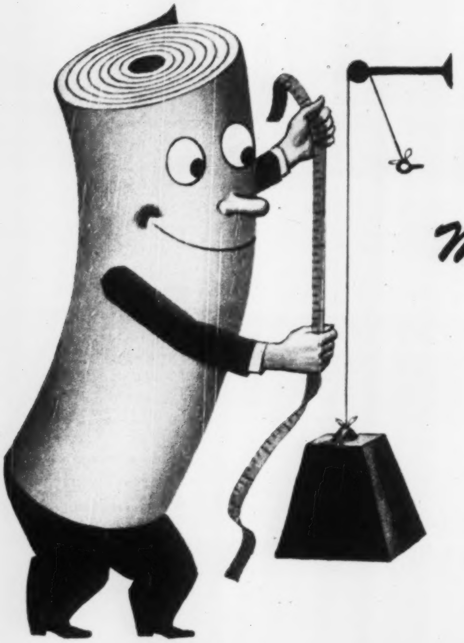

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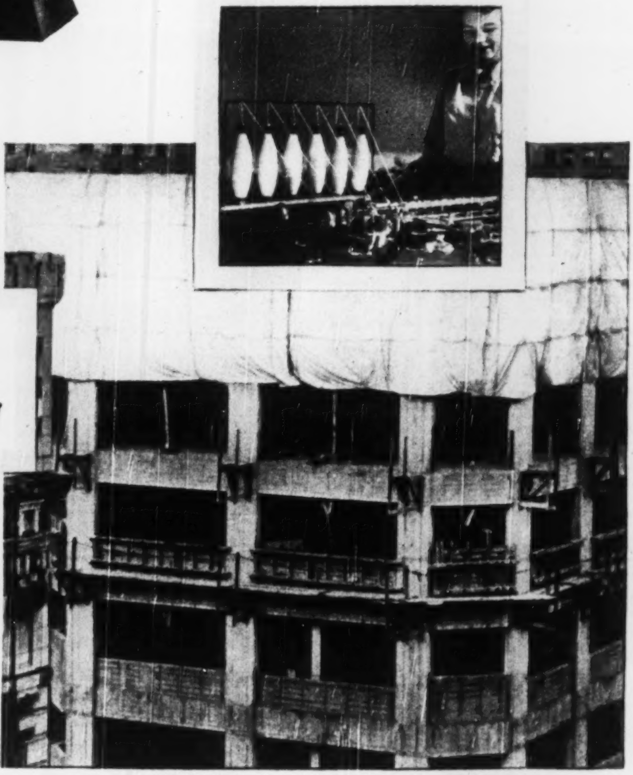

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(Continued from page 299)

Pa., Newton Square—SCHOOL—Ellis Country School, c/o Provident Trust Co. of Phila., 17 and Chestnut Sts., Phila., school rebuilding and repairs. $500,000.

▲ **Pa., Phila.**—APARTMENT—Flamingo Apartments, Inc., Daniel Gevison, pres., c/o John H. Graham, archt., 1010 20 St., N. W., Wash, D. C., working drawings completed apartment, 1240-1246 N. Broad St. $3,000,000.

▲ **Pa., Phila.**—HOSPITAL—Temple University Hospital, Broad and Ontario Sts., plans by James A. Nolen, Jr., 6316 Germantown Ave., hospital, Park and Ontario Sts., $3,000,000; hospital, Broad and Tioga Sts., $3,000,000. CD 4/26/45.

Pa., Pittsburgh—APARTMENT—Lebanon Vue Apartments, Inc., 666 Washington Rd., Zone 16, 6 story, bsmnt., 86x178 ft., brick apartment, Mt. Lebanon Twp. $300,000.

▲ **Pa., Pittsburgh**—STORES and APARTMENT—Ring Eng. Co., Ring Bldg., Wash., D. C., plans by F. Wallace Dixon, 18 and M Sts., N. W. Wash. D. C., 16 story 160x228 ft. U-shaped concrete store and apartment, 6 Ave. and Bigelow Blvd. $6,000,000.

Pa., Pottstown—HOSPITAL—Pottstown Hospital, 1472 Sunset Dr., plans by Vincent G. Kling, 917 Corinthian Ave., Phila., hospital addns. $300,000. CD 2/10.

Pa., Quakertown—HOUSING—Quakertown Chamber of Commerce, c/o George Setman, Route 663, 200 unit housing. $800,000.

Pa., State College—COMMUNITY CENTER—Hillel Foundation I and Ontario Sts., Phila., plans by Louis Magaziner, 701 Walnut St., Phila., community center. $250,000.

▲ **Pa., Upper Darby**—APARTMENT, etc—Corporation, c/o Albert S. Shaw, 856 Main St., Darby, plans by Karl F. Otto, 1528 Buckingham Dr., Rosemont, apartment proj. and shopping center, Garrett and Marshall, Beverly Hills Rds. $13,000,000.

Pa., Upper Darby—APARTMENT—Owner, c/o George A. Greeby, engr., Montgomery Trust Arcade, Norristown, 4 story, bsmnt. apartment. Approx, $250,000.

R. I., Providence—SCHOOL—St. Bartholomew's Roman Catholic Parish, 37 Moorefield St., brick, steel parochial school, Laurel Hill Ave. $250,000.

S. C., Charleston—HOSPITAL—Hospital & Training School for Nurses, 135 Cannon St., hospital. $400,000.

Tenn., Memphis—WAR MEMORIAL—Pi Kappa Alpha, c/o George F. Mahoney, archt., Columbian Mutual Tower war memorial bldg. $250,000. CD 11/7/47.

▲ **Tex., Abilene**—DWELLINGS—A. McAlister & W. O. Hayter, Jr., and R. Elliott & Assoc., Abilene, 87 brick veneer dwellings, $538,410; 70 dwellings, $433,180; 66 frame, brick dwellings, $408,420.

Tex., Alice—APARTMENT—Ed. Collins & Sidney A. Sparks, Alice, plans by Glenn C. Wilson, 1517 Majestic Bldg., San Antonio 32 apartment units for total 6 bldgs. Approx. $250,000.

Tex., Baytown—DWELLINGS—Basswood Development Co., Baytown, 38 frame dwellings, concrete slab fdn. in new section of Wynnewood sub-division. $275,000.

Tex., Bellaire—DWELLINGS—Associated Home Builders c/o M. H. Godbold, Bellaire, plans by Dunaway & Jones, 4919 Montrose Bldg., Houston, 75, masonry frame dwellings, concrete slab fdn., in Lee Manor Addn. $900,000.

Tex., Corpus Christi—HOUSING—Tex-Horn Builders, 4706 Ayres St., frame housing, concrete fdn. in Southside Addn., etc. $250,000.

▲ **Tex., Dallas**—OFFICE—Duncan G. Allen, 1428 Pearson St., plans by Garrison King, 4615 Fannin St. Houston, multi-storied office. $2,750,000.

▲ **Tex., Dallas**—HOTEL—Dallas Citizens Council, c/o Chamber of Commerce, Dallas, 500 room Luxury Downtown Hotel, air-conditioned. $8,000,000.

Tex., Dallas—DWELLINGS—Joe F. Mayberry & Frank H. Garrott, Tower Petroleum Bldg., 20 brick dwellings, concrete fdn., Northport Dr. to near Royal Lane on portion of area to be developed in utilities and sold to contractors. $300,000.

Tex., El Paso—AUDITORIUM—First Baptist Church, 805 Montana St., plans by R. Davis, 1002 Mills Bldg., Archie V. Benner, Jr. and James E. Monroe, 405 Basset Tower, masonry auditorium, 1500 seating capacity. $275,000.

Tex., Fort Worth—SHOPPING CENTER—Dave Clincotsky, 401 N. P. Anderson Bldg., plans by Herman G. Cox, Neil P. Anderson Bldg., masonry shopping center, W. 7 and Clifton Sts. $250,000.

▲ **Tex., Fort Worth**—OFFICE—Continental National Bank, 312 Houston St., plans by Preston M. Geren, Neil P. Anderson Bldg., 28 story, bsmnt., 95x100 ft., 266,130 sq. ft. penthouse office, Houston and W. 7 Sts. $3,000,000-$4,000,000.

Tex., Fort Worth—HOUSING—J. W. Lancaster, 3425 Denton Hy., plans by John W. Floore, Insurance Bldg., 98 bldgs. of 196 apartments, one story frame rein.-con. slab fdn., etc. $750,000. Carter & Burgess, Century Bldg., consult. engrs.

Tex., Harlingen—SUPERMARKET, etc.—H. E. Butt Grocery Co., Robstown Rd., Corpus Christi, masonry supermarket and stores, W. Harrison St. between G and H Sts. $250,000.

▲ **Tex., Houston**—DWELLINGS—Atlantic Building Corp., 1200 Givens St., 550 dwellings, off Griggs Rd. $5,194,200.

▲ **Tex., Houston**—SHOPPING CENTER—Atlantic Building Corp., 1200 Givens St., shopping center off Griggs Rd. $2,000,000.

Tex., Houston—DWELLINGS—Searcy Babbitt, 71 DeBoll St., Sect. 1, 34 siding and cedar shakes dwellings, concrete slab fdns., $260,000; Sect. 2, 48 cedar

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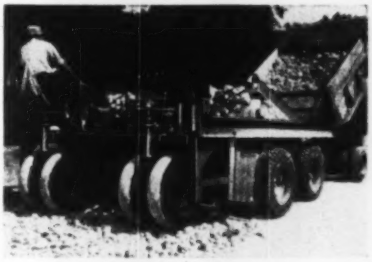

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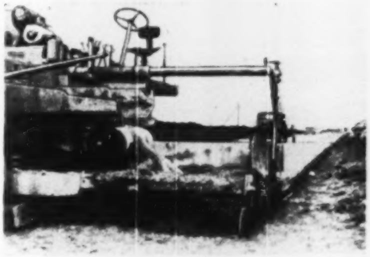

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shake dwellings, concrete slab fdns., $350,000, in Rittenberry Square sub-division, near here.

▲ **Tex., Houston**—APARTMENTS—W. Edward Brown & Assoc., S. Richey St., plans by Joseph B. Reynolds, 2518 Times St., 252 unit apartment rental proj. concrete slab fdns., on Sakowitz St. off Lyons Ave., **$1,000,000**, Shaver Eng. Co., c/o owner engr.; housing, in Riverside Terrace annexes area, **$300,000**.

Tex., Houston—DWELLINGS—Bert Coats & J. Ernest Miller, 2402 Darrington St., 30 addnl. high type dwellings, 2nd sect. of Braes Oaks. **$375,000.**

Tex., Houston—HOUSING—Contractors, Inc., 2410 Branard St., housing in Westridge sub-division. **$320,000.**

Tex., Houston—DWELLINGS—Deerpath Homes, Inc., 4215 York St., 100 addnl. frame dwellings in Lisbon area. **$475,000.**

Tex., Houston—RESIDENCES—Wm. G. Farrington & Assoc., 1719 Sunset Blvd., addnl. high-type residences in Tanglewood Addn. **$600,000.**

Tex., Houston—DWELLINGS—Frank Gaskey, 4221 Coleridge St., addnl. 28 dwellings in Westridge sub-division. **$280,000.**

Tex., Houston—DWELLINGS—Mrs. Vernie G. Glenn, 413 Gulf Bank Rd., 29 dwellings, Atlasta Glenn addn. **$250,000.** R. A. Washburn, c/o Courthouse, engr.

Tex., Houston—DWELLINGS—D. A. Herridge, 303 Cruss St., 47 dwellings, frame type, concrete slab fdn., in Herridge Pl. **$300,000.** Roy M. Pitner, Jr., 1810 Travis St., consult. engr.

Tex., Houston—DWELLINGS—C. E. King, 4110 Dennis St., 60 dwellings, on portion 618-acre tract, Holmes and Griggs Rds. **$480,000.**

Tex., Houston—DWELLINGS—Tom Menefee, 318 Conoly St., 25 dwellings, in Westridge sub-division. **$250,000.**

▲ **Tex., Houston**—DWELLINGS—Monarch Building Co., c/o H. M. Croswell Co. 1st Natl. Bank Bldg., 350 dwellings, off Holmes Rd., **$3,305,400.**

Tex., Houston—CAFETERIA—Old South Cafeteria, c/o John L. Lewis, 1115 Rusk St., interior remodeling of cafeteria seating 1,000. **$350,000.**

▲ **Tex., Houston**—CLASS ROOM, etc.—Rice Institute, 6100 Main St., classroom bldg. **$500,000**; administration, **$375,000**; girls dormitory, **$450,000**; mens dormitory, **$450,000**; dining hall, **$400,000.**

Tex., Houston—DWELLINGS—Robertson Const. Co., 5022 Ennis St., 52 dwellings, **$350,000**; 40 frame dwellings, **$280,000** in area of Sect. 1 of South Union sub-division.

Tex., Houston—DWELLINGS—E. F. Stoerner & Co., 7745 Buena Vista St., 40 dwellings, in Westridge sub-division. **$400,000.**

Tex., Houston—DWELLINGS—Taylor Building Co. 401 Jensen Dr., 30 dwellings, Westridge sub-division. **$300,000.**

▲ **Tex., Pasadena**—DWELLINGS—George W. Batten Co. 1620 Mo St., Houston, 275 dwellings, concrete slab fdns., **$2,475,000**; 225 dwellings, concrete slab fdns., **$2,025,000**; commercial center 7 acre tract, **$1,500,000**, all foregoing in Berkshire Village.

Tex., San Antonio—DWELLINGS—Alamo Lumber Co., Transit Tower, 17 frame, brick, concrete dwellings, between Babcock and Fredericksburg Rds. **$250,000.**

Tex., San Antonio—COMMUNITY CENTER—E. J. Burke & Sons, 4220 S. Zarzamora St., plans by Bartlett Cocke, 3501 Broadway, 50,000 sq. ft. addnl. masonry type community center, New Braunfels Ave. and Brees St. **$600,000.**

Tex., San Antonio—DWELLINGS—Jack Cassidy, Travis Bldg., 20 brick, concrete dwellings, between Babcock and Fredericksburg Rds. **$275,000.**

Tex., San Antonio—DWELLINGS—G. S. McCreless et al, 1102 Fair St., plans by Milton A. Ryan, et al, 601 Elizabeth Rd., 40 Revere (dwellings) Quality Houses. **$300,000.**

Tex., San Antonio—DWELLINGS—Ferrill Fox, 13 Comfort St., 15 brick, concrete dwellings, Babcock and Fredericksburg Rds. **$250,000.**

Tex., San Antonio—HOUSING—Gianotti & Ramsey, 111 W. Basse St., masonry, frame housing, various locations. **$275,000.**

Tex., San Antonio—DWELLINGS—E. S. Johnson 1211 Clower St., 40 addnl. frame dwellings, concrete slab fdn., in Woodlawn Hills area. **$280,000.**

Tex., San Antonio—DWELLINGS—Paul Knolk, 2552 W. Woodlawn St., 18 brick veneer high type dwellings, concrete slab fdns. between Babcock and Fredericksburg Rds. **$260,000.**

▲ **Tex., San Antonio**—DWELLINGS—Lee & Orts, Gunter Bldg., 250 frame dwellings, concrete slab fdn., 72 acre site between S. Flores St. and Pleasanton Rd. **$1,500,000.**

Tex., San Antonio—DWELLINGS—B. B. Smith Co., Gunter Bldg., 22 masonry, frame dwellings between Babcock and Fredericksburg Rds. **$285,000.**

Tex., San Antonio—DWELLINGS—Thrift Lumber Co., 708 W. Summit St., 20 brick, concrete dwellings, between Babcock and Fredericksburg Rds. **$275,000.**

Tex., Tyler—CHURCH—Marvin Methodist Church, Tyler, plans by Monroe Vivian, Tyler, masonry church annex, air-conditioning. **$250,000.**

▲ **Utah, Salt Lake City**—Y.M.C.A. BLDG.—Young Men's Christian Assn., c/o Roger H. Freud, secy., Exchange Pl., plans by Scott & Beecher, Dooly Bldg., Y.M.C.A. bldg. **$1,400,000.**

Wash., Bellingham—APARTMENTS—Hebb & Narodick Constr. Co., Inc., 214 Aloha St., Seattle, plans by Stuart & Durham, 1100 Denny Way, Seattle, six 1

(Continued on page 304)

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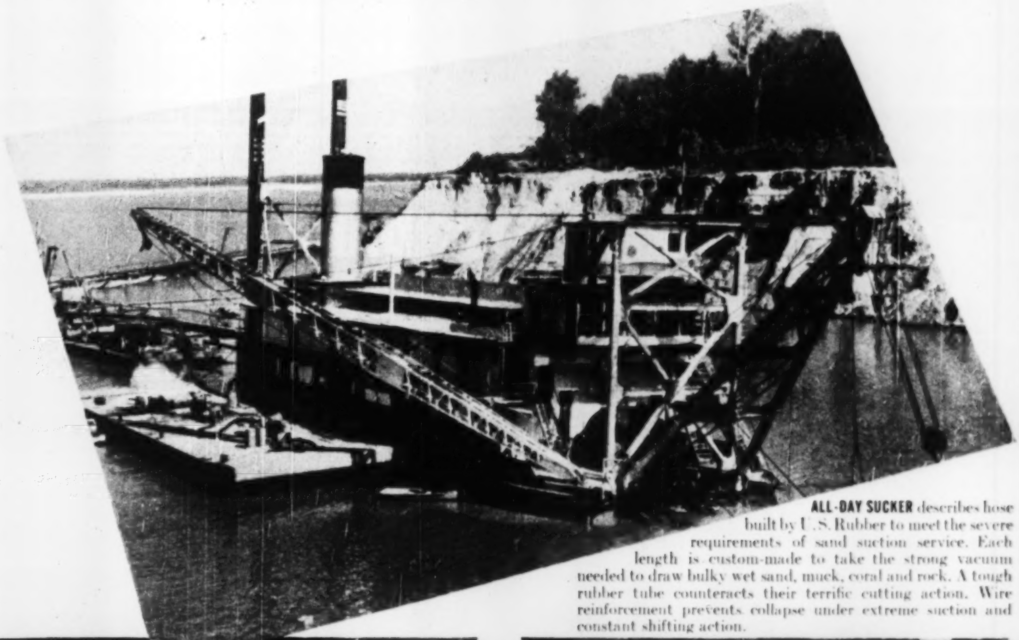

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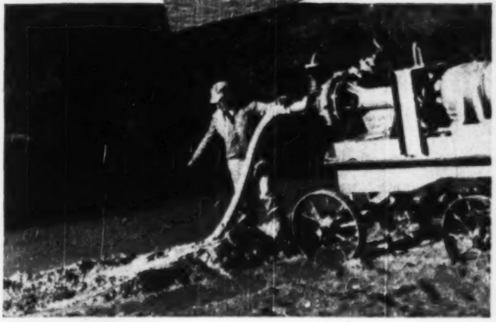

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ROCKEFELLER CENTER, NEW YORK 20, N. Y.

(Continued from page 302)

and 2 story, frame apartments with 20 concrete garages, $450,000.

Wash., Pasco—HOUSES—Modern Home Builders, Inc., 3849 34 Ave. W., Seattle, 42 houses in George and Olmstead Addns. $350,000.

Wash., Pasco—APARTMENT—Peabody & Co., N. 44 St. and Stone Way, Seattle, Zone 3, apartment, $500,000.

Wash., Soap Lake—APARTMENT—E. K. Rushton, Soap Lake, apartment. $250,000.

▲ **Wash., Soap Lake**—HOTEL—J. M. Stoddard, Brownsville, Tex., resort hotel, $1,000,000. CD 2/7, under Wash., Ephrata.

Wash., Spokane—OFFICE—Lincoln First Federal Savings & Loan Assn., N. 120 Wall, plans by Whitehouse & Price, Hutton Bldg., 2 story office addn., $300,000.

▲ **Wash., Tacoma**—APARTMENT—Corp of America Inc., c/o C. F. Davidson, Provident Bldg., plans by Lance, McGuire & Muri, 319 S. 7 St., 17 story apartment. $1,250,000.

Wyo., Powell—HOTEL—Powell Chamber of Commerce, sponsor, Powell, hotel, $300,000.

B. C., Prince Rupert—APARTMENT—Syndicate, c/o W. K. Noppe, archt., 1186 Nicola St., Vancouver, convert former U. S. Army administration bldg. into 60 suite, frame apartment. Approx $225,000; 5 story, rein-con. hotel, incl. movie theatre, dining room, coffee shop, ballroom, stores. Approx. $500,000.

B. C., Vancouver—MEDICAL DENTAL—The Medical Clinic, 710 Seymour St., plans by Semmens & Simpson 614 W. Pender St., 2 story, bsmnt., rein.-con. medical dental bldg. Approx. $250,000.

▲ **Ont., Ramsay**—SANITORIUM—Sudbury-Algoma Sanitorium Assn., Sudbury, plans by L. Fabro, 493 Romsay Rd., Sudbury, and J. B. Sutton, 99 Larch St., Sudbury, sanitorium, $1,000,000.

Ont., Timmins—HOSPITAL WING—St. Marys Hospital, Timmins, plans by P. J. O'Gorman, 209 Mackay Block, Sudbury, 50 bed hospital wing, Approx. $900,000.

Que., Arvida—HOUSING—National Syndicate Aluminum Co. Employees, R. Labrie, vice pres., Arvida, housing. $250,000.

Que. Iberville—DWELLINGS—Centre Bleury Co-operative Habitations, P. O. Box 652, Iberville, 74 dwellings, $450,000.

Que., Joliette—CHURCH, etc.—Roman Catholic Parish of the Christ the King, Joliette, plans by J. E. Perron, 5362 Louis Colin Ave., Montreal, church and presbytery. $300,000.

Que., Mount Bruno—SCHOOL—Girl's Cottage School, 265 Craig St. W., Montreal, plans by Luke & Little, 1410 Guy St., Montreal, girls cottage school, on No. 9 Highway west of mountain. Approx. $500,000.

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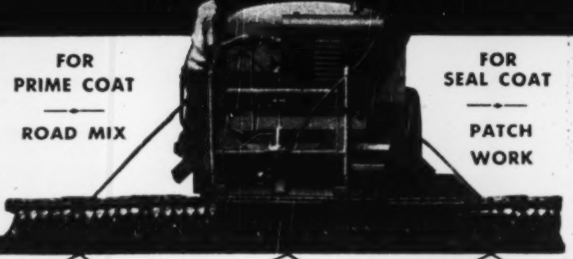

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Que., Norando—COMMUNITY CENTER—Noranda Mines Ltd., Royal Bank Bldg., Toronto, Ont., community center, modern rink, artificial ice plant, gymnasium, curling rink, etc. Ninth Ave. $500,000.

▲ **Que., Rouyn**—SCHOOL—Reverend Sisters of Grey Nuns of the Cross, Sussex St., Ottawa, Ont., school and boarding houses for 250 students, Bagshaw St. $1,000,000.

Que., Shawinigan South (Shawinigan Falls P. O.)—CHURCH—Parish of St. Jeanne d'Arc, Rev. G. Caron, cure, plans by Ludger & P. Lemieux, 760 Victoria Sq., Montreal, church and parish hall exten., 5 St. Approx. $250,000.

Que., Valleyfield—CHURCH, etc.—Roman Catholic Parish of The Sacred Heart, Valleyfield, plans by J. E. Perron, 5362 Louis Colin St., Montreal, church addn., St. Laurence St., $250,000.

INDUSTRIAL BUILDINGS

Ark., Marianna — GRAIN ELEVATOR—Marianna-Lee County Chamber of Commerce, Marianna, grain elevator. $100,000.

Calif., Los Angeles—HEADQUARTERS—Southern California Gas Co., 810 S. Flower St., plans by Albert C. Martin & Assoc., 333 S. Beaudry Ave., 2 story, 34,800 sq. ft., reinforced brick headquarters, Van Nuys Blvd. near Kittridge St. $490,000.

▲ **Colo., Denver**—DISTRIBUTION CENTER—Safeways Stores, 4 and Jackson Sts., Oakland, Calif., distribution center for retail chain store system, $3,000,000. CD 7/1/48.

Ga., Dalton—PLANT—Dalton Candlewick, Inc., R. F. Hamilton, pres., yarn plant. $300,000.

▲ **Ind., Fort Wayne**—PLANT—International Harvester Co., 180 Michigan Ave., Chicago, Ill., plans by Albert Kahn Assoc. Architects & Engineers, Inc., 345 New Center Bldg., Detroit, Mich., 1 story, 250,000 sq. ft., brick engineering bldg., for storage of motor truck division facilities with 1,000 ft. frontage, Meyer Rd. $6,500,000. CD 2/23.

Ind., LaPorte—FACTORY—American Rubber Products Co., La Porte, plans by Boyd Phelps, 1000 Washington St., Michigan City, 2 story, 70x152 ft., brick, concrete, structural steel factory, 315 Brighton St. $175,000.

Kan., Cedar Vale—PLANT—Caney Valley Electric Cooperative, Cedar Vale, plant bldg., structural imprvs., K. W. Dual fuel unit, warehouse modification, $286,000. A. C. Kirkwood & Assoc., Wirthman Bldg., Kansas City, Mo., consult. engrs.

Ky., Frankfort—WAREHOUSE—National Distillers, 120 Broadway, New York, N. Y., plans by Sanderson & Porter, 52 William St., New York, N. Y., brick, rein.-con. whiskey warehouse. $600,000.

Ky., Louisville—SILOS—Buckeye Cotton Oil Co., Floyd St., rein.-con. soy bean storage silos. $250,000.

Ky., Louisville — WAREHOUSE — National Distillers, A. M. S. Div., 120 Broadway, New York, N. Y., plans by Sanderson & Porter, 52 Williams St., New York, N. Y., masonry warehouse. $600,000.

Mich., Dearborn—PLANT IMPRVS—Ford Motor Co., 3000 Shaefer Dr., renovation parts and accessories bldg. at Rouge Plant into engine assembly bldg.; transfer casting machine plant activity to engine bldg.; modernization, expansion of production foundry into space vacated by casting machine plant; reequip steel foundry. CD 6/7/46.

Mich., South Haven—GAS TERMINAL—Aurora Gasoline Co., 15911 Wyoming Ave., 12½ m.g. Marine Gasoline Storage Terminal.

Miss., Laurel—PLANT—Coca-Cola Bottling Plant, Laurel, bottling plant. Approx. $100,000.

▲ **Neb., Beatrice**—PLANT—Northern Natural Gas Co., Aquila Court Bldg., Omaha, plant, $1,600,000. M. C. Madsen, c/o owner, ch. engr.

Neb., Lincoln—PLANT, etc.—Griswold Seed & Floral Co., 120 N. 10 St., plans by Davis & Wilson, 225 Stuart Bldg., plant and offices. $150,000.

Neb., Omaha—PARKING—J. L. Brandeis & Sons, 16 and Douglas Sts., plans by N. S. Wallace, Omaha Natl. Bank Bldg., 400-car parking bldg., 13 and Dodge Sts., $500,000.

N. Y., Niagara Falls—PLANT—E. I. duPont de Nemours & Co., Inc., du Pont Bldg., Wilmington 98, Del., plant to double facilities for production of adiponitrile.

N. C., Burnsville—PLANT—The Duplan Corp., E. C. Grier, pres., Burnsville, 1 story mfg. plant, 14 acres outside limits for weaving and throwing plant. Approx. $500,000.

O., Canton—PLANT—United Engineering & Foundry Co., 1400 Grace Ave. N. E., 12,500 sq. ft. plant addn. to machine shop and shipping facilities. $700,000.

O., Cincinnati—FACTORY—Kruse Hardware, c/o Mr. Schellinger, 6 and Baymiller Sts., Zone 3, 1 story, bsmnt., brick factory and office.

▲ **O., Lockland**—FACTORY, etc.—Gardner-Richardson Board & Carton Co., c/o Duncan Brown, genl. mgr., Cooper Rd., plans by Carl Martin, 1st. Natl. Bank Bldg., Middletown, 1 story, part bsmnt., 240x400 ft., approx. 100,000 sq. ft. brick, rein.-con. factory and 50 ft. tunnel under street connecting to main plant, hydraulic lift. $1,000,000.

Okla., Geary—GRAIN ELEVATOR—Farmers Union, Geary, 200,000 bu. grain elevator. $110,000.

Okla., Oklahoma City—GRAIN ELEVATOR—Farmers Union, 11 N. Klein St., 1 million bu. wheat and corn elevator. $600,000.

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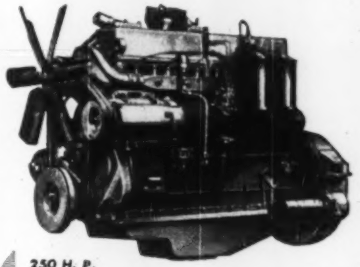

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Model	No. of Cylinders	Displacement (Cu. In.)	Max. H.P. for Continuous Duty
L-HEAD ENGINES			
*AC-5	1	7.1	1.0
*AA-7	1	7.1	1.5
*AU-7	1	7.1	1.5
*AA-7B	1	7.1	2.0
*AU-7B	1	7.1	2.0
N-62	4	62	11.7
Y-69	4	69	14.1
Y-91	4	91	19.4
Y-112	4	112	22.0
F-124	4	124	24.4
F-140	4	140	28.1
F-162	4	162	30.4
F-186	6	186	36.9
F-209	6	209	39.7
F-226	6	226	43.9
M-271	6	271	48.8
M-290	6	290	52.0
M-330	6	330	58.9
B-371	6	371	64.6
B-427	6	427	74.8
OVERHEAD VALVE ENGINES			
G-134	4	134	24.1
G-157	4	157	28.3
H-227	4	227	39.2
H-243	4	243	42.1
33-R-501	6	501	89.8
R-513	6	513	96.7
R-572	6	572	108.0
R-602	6	602	113.5
S-749	6	749	141.3
DIESEL ENGINES			
GD-157	4	157	26.4
HD-243	4	243	39.0
RD-572	6	572	96.5

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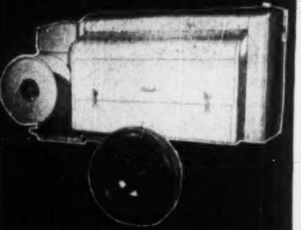

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Gordon Smith & Co. Bowling Green, Ky.

Okla., Oklahoma City—FACTORY, etc.—Mucklanburg-Duncan Co., 100 N. W. 23 St., plans by Berlowitz & Cammander, 1916 N. Broadway, 300x500 ft. factory and warehouse, N.W. 41 and Santa Fe Sts. $500,000. CD 12/30.

Pa., Edgely—PLANT—Philco Radio & Television Corp., Tioga St. at C St., Phila., mfg. plant. Approx. $500,000.

Pa., Phila.—BAKERY, etc.—General Baking Co., 420 Lexington Ave., New York, N. Y., bakery and warehouse, 25 and Mifflin Sts. Approx. $500,000. Joseph Sauter, c/o owner, directing engr.

Pa., Phoenixville—PLANT—Phoenixville Publishing Co., 167 Bridge St., plant. $175,000.

▲ **Tex., Amarillo**—PLANT, etc.—Colorado Interstate Gas Co., Box 1087, Colorado Springs, Colo., gasoline plant, $1,500,000; 4,800 hp. compressor station, appurtenances, $500,000; dehydration plant, $1,150,000.

Tex., Carthage—SUB-STATION—Southwestern Gas & Electric Co., Longview, electric sub-station expansion. $100,000.

▲ **Tex., Dallas**—SUB-STATIONS—Dallas Power & Light Co., Dallas Power & Light Co. Bldg., electric sub-stations in north sect. expanded area, $1,250,000; in eastern sect. of city, $750,000. CD 1/20.

Tex., Gladewater—SUB-STATION—Southwestern Gas & Electric Co., Longview, electric sub-station expansion. $100,000.

Tex., Houston—AUTO SERVICE, etc.—Downtown Chevrolet Co., 1400 McKinney St., plans by Henry S. Hoffman, M & M Bldg., auto service, shop sales. $185,000. John G. Turney, 2405 San Jacinto St., consult. engr. CD 2/16.

Tex., Houston—WAREHOUSE—Gardner Salvage Co., 615 Preston St., 60x360 ft. concrete, steel warehouse. $200,000.

Tex., Houston—PLANT—Houston Diced Cream Co., 2606 Westheimer Rd., remodeling, expanding masonry dairy products and cream plant. $100,000.

Tex., Houston—WAREHOUSE STORAGE—Magnus Metal Div. National Lead Co., 1415 Hardy St., metal, concrete, steel type warehouse storage. $100,000.

Tex., Kilgore—SUB-STATION—Southwestern Gas & Electric Co., Longview, electric sub-station expansion. $125,000.

Tex., Marshall—SUB-STATION—Southwestern Gas & Electric Co., Longview, electric sub-station expansion. $150,000.

Tex., Palestine—PACKING PLANT—Vernon Calhoun Packing Plant, Palestine, reconstructing meat and cold storage packing plant. $125,000.

▲ **Tex., Pharr**—PLANT—Valley Fruit Co., c/o Roy Weir, Pharr, citrus concentrate plant, 30 acre tract on North Hy. $1,000,000.

▲ **Tex., Snyder**—PLANT—Lion Oil Co., Snyder, 40 m. cu. ft. capacity natural gasoline plant, in North Snyder field. $2,750,000; 8 mi. lateral pipe line between Roscoe Station and Snyder, $140,000.

▲ **Va., Roanoke**—TRANSMISSION STATION—Appalachian Electric Power Co., 129 Campbell Ave. E., high voltage transmission station on 20 acre site near first river bridge between Roanoke and Salem. $1,000,000.

Wash., Everett—SUB-STATION—Snohomish Pub. Utility Dist., Everett, sub-station. $100,000.

Wash., Seattle—WHOLESALE MEAT—Northern Pacific Ry. Co., B. Blum, ch. engr., St. Paul 1, Minn., plans by J. I. Mattson, Lowman Bldg., remodeling wholesale meat. $115,000.

Wash., Vancouver—MILL—Aluminum Co. of America, Gulf Bldg., Pittsburgh, Pa., rod mill addn. $300,000.

Wyo., Cheyenne—WAREHOUSE—Wyoming Co-operative Wool Marketing Assn., Cheyenne, warehouse. $100,000.

▲ **Philippine Islands, Makati**—POWER PLANT—Manila Electric Co., Manila, power plant at Rockwell Station. $1,900,000.

Alta., Edmonton—PLANT—Crutcher, Rolfs & Cummings, Inc., Niels Esperson Bldg., Houston, Tex., U.S.A., assembly and mfg. plant. $100,000.

Alta., Lethbridge—PRINTERY—Herald Company Ltd., 14 6 St., Lethbridge, printery. $150,000.

N. B., Grand Falls—PLANT—Dominion Coal Bd., Ottawa, Ont., coal washing and cleaning plant. Approx. $100,000.

N. B., Minto—PLANT—Dominion Steel & Coal Co., Ltd., Minto, coal washing and cleaning plant. Approx. $100,000.

▲ **Ont., Kapuskasing**—MILL—Kimberly-Clark Corp. of Canada Ltd., 50 King St. W., Toronto, new mill unit. Approx. $3,000,000.

Que., Montreal—FACTORY, etc.—H. Birks & Sons (Montreal) Ltd., 1240 Philips Sq., factory and warehouse, Ogilvie Ave. $100,000.

Que., Montreal—WAREHOUSE—General Motors of Canada Ltd., Oshawa, Ont., plans by A. [illegible] Perry, 1434 St. Catherine W., 227x310 ft. [illegible] warehouse, Cote de Liesse Rd. $400,000.

Que., St. Jerome de Metabetchonan—[illegible] Machinerie Ltd., St. Jerome De Metabetchouan, [illegible] office. Approx. $100,000.

Que., Shawinigan Falls—PLANT—Consolidated Paper Co., Ltd., Sun Life Bldg., Montreal, plant addn. $200,000.

Que., Shawinigan Falls—FACTORY—Wabasso Cotton Co., Ltd., Station Rd., factory addn. $150,000.

Sask., Regina—WAREHOUSE—Firestone Tire & Rubber Co. of Canada Ltd., Regina, 200x200 ft. concrete brick warehouse. $350,000.

(Continued on page 308)

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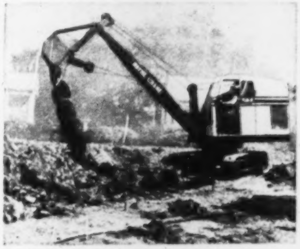

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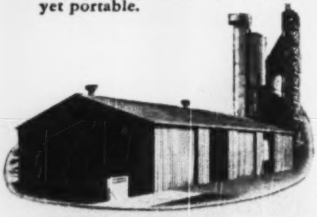

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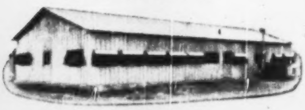

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(Continued from page 306)

UNCLASSIFIED

Arkansas—RURAL DISTRIBUTION LINES—C. & L. Rural Electric Co-operative, Star City, 309 mi. rural distr. lines and other imprvs., Proj. ARK 21, Lincoln Co. $525,000. Chanaberry Eng. Co., Coleman Bldg., Louisville, Ky., consult. engr. CD 12/9/48.

Arkansas—RURAL DISTRIBUTION LINES—Ozark Rural Electric Co-operative, Fayetteville, 147 mi. rural distr. lines and other imprvs., Proj. ARK 24, Washington Co. $265,000. Frank Horton & Co., Lamar, Mo., consult. engrs. CD 2/9.

Calif., Oceanside—SWIMMING POOL—City Council, bond election April 11, swimming pool, $180,000.

▲ **Calif., San Francisco**—PIER—Bd. State Harbor Comrs., Ferry Bldg., pier addns. at Piers 30, 31 and 32 Matson Navigation Co., $1,250,000.

Ill., Urbana—DRIVE-IN THEATER—Frank Stewart, c/o Family Amusement Co., Danville, 607-car drive-in theatre on Route 45, near here. $125,000.

Ind., Hamilton—DRIVE-IN THEATRE—George Turlukis, c/o Rossville Theatre, Hamilton, 1,000 car drive-in theatre, Dixie Hy., south of here. $185,000.

Ind., Shelbyville—DRIVE-IN THEATRE—Sky-Lines, Inc., c/o Harlan Waits, Shelbyville, 500 car drive-in theatre, at intersection of State Rts. 29 and 44, 1 mi. east of here, approx. $100,000.

Ia., Sioux City—FIELD HOUSE, etc.—Independent School Dist., plans by Wm. Beuttler, Insurance Exchange Bldg., field house, swimming pool and vocational shops. $900,000.

Kansas—RURAL DISTRIBUTION LINES—Sekan Electric Co-operative, Girard, 6.5 mi. transmission lines, 105.5 mi. rural distr. lines, completion of previously approved constr., Bourbon, Cherokee, Crawford, Labette and Neosho Counties, $455,000. CD 3/2.

▲ **Kentucky**—RURAL DISTRIBUTION LINES—Fleming Mason Rural Electric Co-operative, Flemingsburg, approx. 500 mi. rural distr. lines, 2 electric sub-stations, Bath, Carter, Greenup, Bracken, Mason, Lewis, Elliott, Powell, Robertson and Rowan counties. $3,000,000. Patterson & Dewar, 208 Rutland Bldg., Decatur, Ga., consult. engrs. CD 6/30.

Md., Baltimore—PIER—Maryland Dry Dock Co., Inc., Geo. H. French, pres., Fairfield, Baltimore, 45x800 ft., steel piling and decking constr. and repair, Pier 3, Fairfield. $150,000. F. Lester Simon, 1104 Mercantile Trust Bldg., engr.

Michigan—RURAL DISTRIBUTION LINES, etc.—Consumers Power Co., Jackson, transmission lines, imprvs., Adrian, Tecumseh, Manchester, Montgomery, Camden, Pleasant Lake, Erie, and Dunbar; sub-stations, LaSalle, Onsted, North Adams, Pittsford, Sylvan and Concord; 60,000 kw generator at B. C. Cobb Plant, Muskegon; 46 mi. gas mains leading to company's Michigan storage field, near Cadillac. CD 12/17.

Mich., Detroit—PARKING AREA—Dpt. P. Wks., 104 City Hall, concrete asphalt parking area, Livernois and Seven Mile Rds., $306,000.

Miss., Ripley—NATURAL GAS SYSTEM—City, c/o City Clerk, voted bonds Feb. 21, natural gas sys., $545,000. CD 1/30.

Missouri—SIGNAL SYSTEM—Missouri Pacific R.R., R. F. Hart, ch. engr., Missouri Pacific Bldg., 13 and Olive Sts., St. Louis, Zone 3, installing electric block signal sys. along railroad between Mill Spring and Poplar Bluff. $218,000.

▲ **Missouri**—RURAL DISTRIBUTION LINES—Northwest Electric Power Co-operative, Savannah, transmission lines, substations northwest Missouri counties, $18,350,000. Henningson Eng. Co., Standard Oil Bldg., Omaha, Neb., engr. CD 2/13.

Mo., St. Louis—SWIMMING POOL—City, c/o Frank J. McDevitt, pres. Bd. Pub. Service, 304 City Hall, 12 and Market Sts., Zone 3, 55x150 ft. rein.-con. swimming pool, Tandy Park Community Center. $160,000. CD 6/23/44.

Nebraska—RURAL DISTRIBUTION LINES—Cherry-Todd Electric Co-operative, Valentine, 260 mi. rural distr. lines, Cherry Co. $300,000. D. O. Flahart, Rapid City, S. D., consult. engr.

Nebraska—RURAL DISTRIBUTION LINES—Seward County Rural Public Power Dist., Seward, 110 mi. rural distr. lines, Seward, Lancaster, Butler and York Counties. $125,000. Henningsen Eng. Co., Standard Oil Bldg., Omaha, consult. engr.

Nebraska—RURAL DISTRIBUTION LINES—Southwest Electric Membership Corp., Palisade, 390 mi. rural distr. lines, Chase, Dundy and Hayes Counties. $425,000. Flora Eng. Co., 501 Jackson St., Topeka, Kan., consult. engr.

Nebraska—RURAL DISTRIBUTION LINES—York County Rural Public Power Dist., York, 395 mi. rural distr. lines, Clay, Hamilton, Fillmore and York Counties. $425,000. Henningson Eng. Co., Standard Oil Bldg., Omaha, consult. engr.

Neb., Omaha—UNDERGROUND PARKING—City, City Hall, 18 and Farnam Sts., underground parking, 17 and Farnam Sts. $250,000. E. W. Woodbridge, city engr.

N. J., Trenton—STADIUM—City, plans by Louis Kaplan, 25 Montgomery Ave., municipal stadium, $500,000.

N. Y., Canton—ATHLETIC ARENA—St. Lawrence University, Canton, athletic arena. $400,000.

▲ **Ohio**—DISTRIBUTION SYSTEM, etc.—Columbus & Southern Ohio Electric Co., 215 N. Front St., Columbus, distr. system expansion, $4,575,000, incl. new sub-station in eastern part of Columbus, $150,000; sub-station near Athens, $80,000; sub-station at Camp Sherman near Chillicothe, $50,000; Canal, Rich and Gay St., sub-stations addns. $100,000; installing voltage regulating equip., $400,000; installing equip. in sub-stations throughout 21 county area, $630,000; constr. 25 mi. rural distr. lines near here and 210 mi. rural territories of southern area, $330,000; rebuild distr. system in Grove City, $130,000; imprv. underground distr. sys. in downtown Columbus, $130,000; street lighting imprvs. principally in Chillicothe and McArthur, $115,000; purchase and install distr. transformers, $480,000; purchase and install meters, install service wires to new customers, $640,000; new service bldgs., in southern Ohio and in Columbus (four new bldgs.), $600,000; and minor addns., alterations to other company structures, $400,000; overhead transmission line, 138,000 volt from E. M. Poston generating plant in Athens Co., to Chillicothe to Circleville and to Marion Rd. in South Columbus, $2,035,000; transmission lines connecting the new sub-stations to be built in Columbus, $690,000; imprv. other transmission circuit of lower voltage at various points in Central and Southern Ohio, $455,000; new 138,000 volt sub-stations in or near Columbus, $1,300,000; 138,000 volt sub-station in Chillicothe, $465,00; finish erection of high voltage sub-station in Circleville, $135,000; addns. to transmission sub-stations in and near Columbus and in Athens, Ross and Highlands Counties, $680,000.

Pa., Kulpont—COAL VEIN TRENCH—U. S. Bureau of Mines, C St. between 18 and 19 Sts. N.W., Wash. 25, D. C., constr. trench to cut coal vein for purpose of stopping spread of fire in abandoned coal mine, $105,000.

R. I., Providence—PARKING FACILITIES—City, Dennis J. Roberts, mayor, City Hall, parking facilities for 200-225 autos, land constr., landscaping, curbing, lanes, etc. Pershing Square. $110,000. John E. Meade, City Hall, city engr.

South Carolina—RURAL DISTRIBUTION LINES—Santee Electric Co-operative, Kingstree, 61 mi. rural distr. line and sys. imprvs., Williamsburg Co. $275,000.

S. D., Rapid City—SWIMMING POOLS—City, plans by Matter & Fraley, Rapid City, 2 swimming pools. $180,000. CD 10/15/47.

Tenn., Carthage—GAS LINES—Town, installing gas in city and connecting with main 8 mi. away. $250,000. Barnard & Burk, Chattanooga Bank Bldg., Chattanooga, consult. engrs.

▲ **Tenn., Nashville**—UNDERGROUND AUTO PARKING—City, City Hall, plans by Hart & McBryde, Cotton States Bldg., 4-level underground auto parking facilities under Memorial Square. $3,500,000.

Texas—RURAL DISTRIBUTION LINES—Cap Rock Electric Co-operative, Stanton, 394 mi. rural distr. lines, Martin Co. $435,000. CD 4/22/48.

Texas—RURAL DISTRIBUTION LINES—Nueces Electric Co-operative, Robstown, 338 mi. rural distr. lines, 133 mi. line re-building, Nueces Co. $640,000. CD 6/11/48.

Texas—RURAL DISTRIBUTION LINES—Rita Blanca Electric Co-operative, Dalhart, 551 mi. rural distr. line and sys. imprvs., Dallam Co. $580,000. CD 9/27/48.

▲ **Texas**—GAS PIPE LINE—Texas-Eastern Transmission Corp., 1103 Esperson Bldg., Houston, 108 mi. 16 in. welded joint gas pipe line between Provident City and Baytown. $3,240,000.

Tex., Brownsville—RESORT, etc.—Cameron Co., c/o Comrs. Court, Brownsville, bond election Mar. 25, Site No. 1, Padre Island resort, playgrounds, park, $850,000. Parsons, Hall & Macdonald, 51 Broadway, New York, N. Y., consult. engrs. CD 1/19.

Tex., Clairemont—OIL PIPE LINE—Stanolind Pipe Line Co., Lubbock, 36 mi. 16 in. crude oil pipeline. $640,000.

† **Tex., El Paso**—FENCING—Public Health Service, U. S. Quarantine Dpt., Federal Security Bldg., 3 St. and Independence Ave. S. W., Wash. D. C., construct 500 mi. barbed wire and wire mesh fencing on Mexican border west of here. $250,000.

Tex., Henderson—TRANSMISSION LINE—Southwestern Gas & Electric Co., Longview, 41½ mi. 66,000 volt transmission line completing loop through here. $130,000.

Tex., Houston—WHARF IMPRVS.—Harris County Navigation Dist., c/o Port Comn.; Wharf 3, road constr. in new Wharf 16 area, $50,000; earthwork and drainage, $50,000; railway sidings, $60,000, above work in Wharf 16 area. Lockwood & Andrews, Union Natl. Bank Bldg., consult. engrs. CD 8/28/47.

▲ **Tex., Longview**—TRANSMISSION LINE—Southwestern Gas & Electric Co., Longview, 8 mi. 132,000 volt transmission line between power plant and Whitney sub-station, $340,000; addnl. electric transmission and distr. lines, eastward sects. from Longview, $750,000.

Tex., Snyder—OIL PIPE LINE—Pan-American Production Co., M. Esperson Bldg., Houston, crude oil pipe line exten. to connect with main line to coast, $150,000.

Washington—RURAL DISTRIBUTION LINES—Public Utility Dis. 1 of Kittitas Co., Ellensburg, 21 mi. rural distr. line, 12 mi. 33 kv. transmission line and sys. imprvs., Kittitas Co. $197,000.

Wash., Connell—ELECTRIC SERVICE—Electric Co-operative Inc., Ritzville, electric service expansion, $150,000. Inland Eng. Co., Ritzville, consult. engr.

▲ **Wis., Milwaukee**—STADIUM—Milwaukee Co. Court House, stadium, $2,500,000. Osborn Eng. Co., 7016 Euclid Ave., Cleveland, O., consult. engr. E. A. Howard, c/o owner, engr.

Alaska, Craig—HYDRO-ELECTRIC PROJECT—City, City Hall, hydro-electric proj. $349,800. A. Erickson, Commercial Bldg., Ketchikan, consult. engr.

Alaska, Petersburg—ELECTRIC DISTRIBUTION SYS.—Town, Town Hall, electrical distr. sys. $400,000. F. J. Toner, Juneau, consult. engr.

N. B. Caraquet—HARBOR IMPRVS., etc.—Government of Canada, Ottawa, Ont., harbor imprvs., repairs. $281,000 voted.

N. B., Richibucto—HARBOR IMPRVS.—Acting Secy. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., harbor imprvs. at Richibucto Cape. Approx. $100,000. R. Blais, c/o owner, engr.

Newfoundland, Bonaventure—WHARF, etc.—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., deepwater wharf and dredging. Approx. $305,000. R. Blais, c/o owner, engr.

Ont., Aylmer—ICE ARENA—Citizens Com., c/o the Mayor Aylmer, ice arena, $120,000.

Ont., Goderich—HARBOR WORKS—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, harbor works repairs, Approx. $230,000. R. Blais, c/o owner, engr.

Ont., Hamilton—CLUBHOUSE—Municipality, plans by Parks Bd., City Hall, clubhouse for Chedoke Golf Club. $125,000.

Ont., Hamilton—HARBOR IMPROVS.—Acting Secy. Dpt. P. Wks., Hunter Bldg., Ottawa, addnl. harbor imprvs. Approx. $315,000. R. Blais, c/o owner, engr.

Ont., Islington—ICE ARENA—Islington Ice Arena Gardens, Ltd., Islington, artificial ice arena. $100,000.

Ont., Midland—HARBOR REPAIRS, etc.—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., harbor repairs, imprvs., Approx. $150,000. R. Blais, c/o owner, engr.

Ont., Port Stanley—PIER—Government of Canada, Ottawa, Ont., pier reconstruction. $100,000 voted.

Ont., Toronto—ARENAS—Municipality, 3 arenas $600,000. Murray Stewart, city engr.

Que., Etang du Nord—HARBOR—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., harbor improvs. Approx. $100,000. R. Blais, c/o owner, engr.

Que., Grande Greve—FISHING HARBOR—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., fishing harbor, Approx. $106,000. R. Blais, c/o owner, engr.

Que., Grande Riviere—HARBOR REPAIRS—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., harbor works repairs, Approx. $121,500. R. Blais, c/o owner, engr.

Que., Havre St. Pierre—WHARF IMPRVS.—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf imprvs. Approx. $250,000. R. Blais, c/o owner, engr.

Que., Huntingdon—SKATING RINK—County War Memorial Com., Huntingdon, 80x180 ft., concrete skating rink seating 4,000 at Fair Grounds, $110,000.

Que., Montreal—RECREATIONAL CENTER—Roman Catholic Parish of St. Jean Baptiste, Rachel St. E., plans by J. E. Perron, 5362 Louis Colin Ave., recreational centre for Parish of St. Jean Baptiste, Rachel St. East. $150,000.

Que., Petite Madeleine—WHARF—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf, Approx. $100,000. R. Blais, c/o owner, engr.

Que., Pointe au Pic—WHARF—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf reconstr., enlargement, Approx. $200,000. R. Blais, c/o owner, engr.

Que., Quebec City—FISHING HARBOR—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., fishing harbor at Hospital Bay. Approx. $100,000. R. Blais, c/o owner, engr.

Que., Ste. Felicite—WHARF—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf reconstr., Approx. $124,000. R. Blais, c/o owner, engr.

Que., Sept Iles—WHARF—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., wharf, Approx. $250,000. R. Blais, c/o owner, engr.

WATER SUPPLY

BIDS ASKED

N. B., Renous—B.A. 3/29—Canadian Commercial Corp., engrs., 70 Lyon St., Ottawa, Ont., water distr. sys. for Government of Canada, Ottawa, Ont. Plans deposit $25.

Ill., Decatur—B. A. 4/3—City, Council Room, County Bldg., Sect. K imprvs., approx. 15 mi. 6- to 18-in. water mains Div. 1, connection for elevated water storage tank and mains in Garfield Ave. and Broadway; Div. 2, water mains North St., Prairie Ave. and Wood St. Div. 3, water mains Lincoln Park Dr., Willow St., Sunset and Fairview Aves.; Div. 4, water mains Pythian Addn. Div. 5, water mains Pritchett and Lamar Addns., Div. 6, water mains Oak Grove Addn. Plans deposit $25. J. A. Hedrick, mayor. CD 1/20, under LB.

N. Y., Westfield—B. A. 4/6—Bd. Village Trustees, Municipal Bldg., 23 Elm St., water treatment plant. Plans deposit $10. William S. Lozier Co., 10 Gibbs St., Rochester, engrs. CD 10/11/44.

Tenn., Franklin—B.A. About 4/15—City, water supply sys. $500,000. Polk, Powell & Hendon, Stalling Bldg., Birmingham, Ala., engrs. CD 2/2.

Ia., Bonaparte—B.A. 4/17—City, City Hall, WW. sys. imprvs., incl. pump house, pump equipment, steel cover on standpipe, distr. line extens., sys. sterilization, etc. Stanley Eng. Co., Hershey Bldg., Muscatine, engr.

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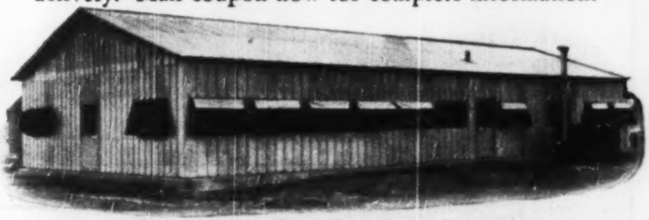

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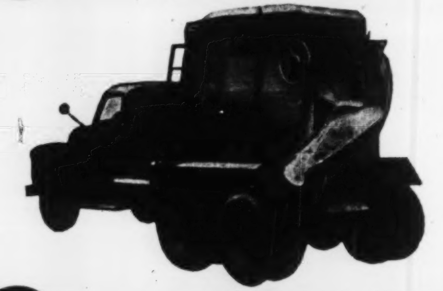

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LOW BIDDERS

Fla., Jacksonville—City, City Hall, Mar. 2, water distr. sys. extens., imprvs., north of St. Johns River, Part 1, Adv No. 2-2532, from Joseph Reinertson, c/o engrs. $599,400. Reynolds, Smith & Hills, 227 Park St., Zone 1, engrs. CD 2/13.

CONTRACTS AWARDED

Calif., Tulare—City Council, 411 E. Kern St., 22,771 ft. 4- to 16-in. c.i. water pipe lines, to W. M. Lyles, Box 495 Avenal. **$35,123.** Est. approx. $28,000. Bids 3/2. CD 2/21.

Ont. Toronto—York Twp. H. A. Hall, clk., 40 Jarvis St., installing 5,200 ft. 20 and 1,800 ft. 16 in. c.i. trunk water mains in portions Tichester Rd., Claxton Blvd., Connaught Circle, Heath and Bathurst Sts., to G. M. Gest Ltd., 15 Dartnell Ave. Approx. **$60,000.** Bids 2/15. CD 2/8.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Minn., New Brighton—B.A. 3/28—Village, Lucille I. Olchefski, clk., sanitary sewers, outfall sewer and lift station, $125,000. Plans deposit $5. Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, engrs. CD 12/15.

Wis., Waupun—B.A. 2/28—City, sewage treatment plant. $350,000. J. Donohue Eng. Co., 608 N. St., Sheboygan, engr. CD 6/29/44.

Conn., Middletown—B.A. 3/30—City, S. C. Cannon, supt. P. Wks., rubbish disposal incinerator, Kennedy Meadows, $50,000. Bid date changed. Nichols Eng. Co., 42 Drouve St., Bridgeport, engrs. CD 1/11.

Pa., Schuylkill Haven—B.A. 3/30—Schuylkill Haven Municipal Auth., Boro Hall, Schuylkill Haven, Sect. 1, sanitary sewerage sys., consisting 98,226 ft. 8- to 18-in. pipe, 350 manholes, other appurtenances; Sect. 2, primary sewage treatment plant incl. control bldg., separate sludge digestor, primary settling tanks, sludge drying beds and other appurtenances, 3 pump. stations, plumbing, heating and electrical work. Plans deposit $25. Ivan M. Glace, 1001 N. Front St., Harrisburg, consult. engr. CD 6/30/47.

Wyo., Sheridan—B.A 4/3—State of Wyoming, Bd. Charities & Reform, State Capitol Bldg., Cheyenne, sewage treatment plant for Wyoming Girl's School, Approx. $50,000 . Plan deposit $10. E. C. Gwilliam, Sheridan, archt. and engr.

Calif. Susanville — B.A. 4/4 — Susanville Consolidated Sanitary Dist., Bank of America Bldg., sewage treatment plant, Approx. $50,000. Plans deposit $25. W. Robert Jennings, City Hall, city engr. CD 9/26.

† **N. Y., Brooklyn**—B.A. 4/4—At office J. J. Chew, captain, Officer-In-Charge of Construction, Bldg 77, New York, Naval Shipyard installing sewerage on Second and Third Sts., New York Naval Shipyard Spec. 22348. Plans deposit $10.

Ore., Portland—B.A. 4/4—City, City Hall, 2nd unit outfall sect. in sewage treatment proj., incl. 1,900 ft. 54 in., 1,900 ft. 72 in., 700 ft. 82 in. subaqueous and five structures as inlets and outlets as 2 sized pipes cross Columbia and Oregon Sloughs of Columbia and extend 700 ft. into Columbia River. Plans deposit $25. L. G. Aperson, city engr. CD 7/20/45.

Va., Franklin—B.A. 4/4—At office E. N. Wilkinson, town mgr., Franklin, sewage disposal plant, complete with junction control box, grit remover, comminutor, pumping equip., 40 ft. and 50 ft. clarifier tank, 70 ft. high rate filter, 50 ft. digester tank, 2 glass enclosed sludge drying beds, 37x45 ft. pump house, etc.; 6.753 mi. 4- to 18-in. vitr. clay sewers. Plans deposit $25 each. CD 6/30/47.

LOW BIDDERS

Calif., Los Angeles—City Bd. P. Wks., City Hall, rejected bids Feb. 8, remodel sewage pumping plant in Union Pacific Ave., **L. B. $58,050.** CD 2/20, under LB.

CONTRACTS AWARDED

Ariz., Tucson—Pima Co. Sanitary Dist., Pima Co. Courthouse, sewer exten., to Mark Cockrill Constr. Co., 1917 W. Grant St., Phoenix, **$130,449.** Awarded 2/28.

Tex., Brownsville—City, sanitary sewer line exten. Purchase and Hire. **$69,000.** CD 7/30/48.

BRIDGES

CONTRACTS AWARDED

Ont., St. Catherines—Canadian National Rys., B. Wheelwright, ch. engr., 360 McGill St., Montreal, railway bridge on No. 3 Highway, own forces, **$100,000.** CD 7/14.

STREETS AND ROADS

LOW BIDDERS

Tex., Beaumont—Jefferson Co., Comrs. Court, Beaumont, Feb. 20, road work, No. 48-4 Proctor St. exten., 55-2 Terminal Rd. and 89-1 Avenue B exten. at Port Arthur from R. W. McKinney, Nacogdoches, **$109,511.** Est. $60,000. Charles L. Davidson, co. engr. CD 4/10/47.

Calif., Los Angeles—City Bd. P. Wks., City Hall, imprv. Paseo Del Mar from Gaffey St. to Weymouth Ave., to Griffith Co., 1060 S. Broadway, **$90,025.** Est. approx. $50,000. Bids 3/1, awarded 3/6. CD 2/3.

(Continued on page 312)

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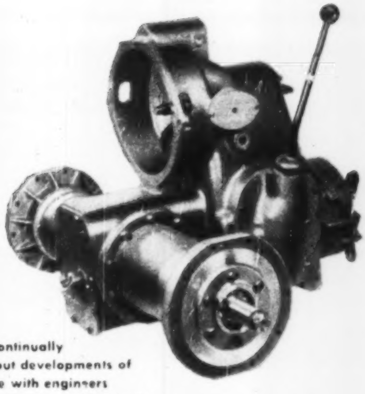

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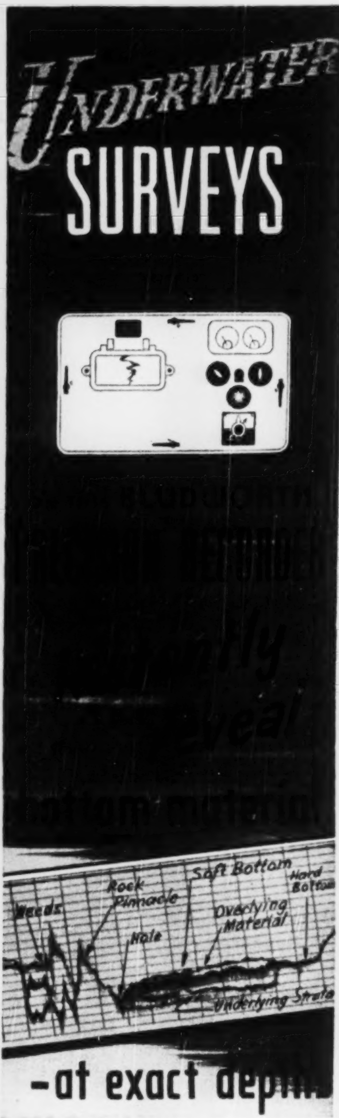

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(Continued from page 310)

Calif., San Diego—City Council, Civic Center, imprv. Wabash Blvd. and Federal Blvd., to Daley Corp., Box 67 North Park Sta., **$710,444**. Bids 2/21, awarded 2/28. CD 2/28, under LB.

EARTHWORK, WATERWAYS

BIDS ASKED

† **Delaware**—B.A. 3/28—U. S. Eng., 121 N. Broad St., Phila., Pa., retaining embankments and drainage structures Pigeon Point Disposal Area, along west shore of Delaware River exten. from about 2,000 ft. to about 9,600 ft. downsteream from mouth of Christina River, southern city limits of Wilmington, New Castle Co. INV. CIVENG-36-109-50-53. $200,000. Extended date. CD 2/23.

† **Massachusetts**—B.A. 3/28—U. S. Eng., 80 Lafayette St., New York 13, N. Y., flood protection proj., Hoosic River, North Adams, Berkshire Co., CIVENG 30-075-50-68. Extended date. CD 2/8.

† **Michigan**—B.A. 3/28—U. S. Eng., 609 Federal Bldg., Dertoit, Zone 31, approx. 2,165 lin. ft. steel sheet pile breakwater and dredging 900 ft. harbor basin, 500 ft. wide to project depths of 6 ft. and 10 ft. below low water datum and an entrance channel to project depth 12 ft. below low water datum, located on west shore of southerly end of Lake Huron, about 30 mi. north of Port Huron, abreast of village of Port Sanilac, Sanilac Co. CIVENG 20-064-50-72, Extended date. CD 2/1.

† **Missouri**—B.A. 3/28—U. S. Eng., 1709 Jackson St., Omaha, Zone 2, Neb., Agricultural Levee Unit L-550, Sects 13 to 19 (inclusive) near Phelps City, exten. from Brownville Bridge downstream along left bank of Missouri River to mouth of Rock Creek, Atchison Co., CIVENG-25-066-50-135. CD 2/28.

Pennsylvania—B.A. 3/23—Dpt. Forests & Waters, 404 Education Bldg., Harrisburg, furnishing, erecting an 8 in. dredge, booster and pumping equip., oil barge and furnishing, stowing of pipe lines at Tamaqua desilting basin, Schuylkill Co. $200,000. Plans deposit $10. Schuylkill River Project Engineers, 20 S. 15 St., Phila., engrs.

† **Virginia and North Carolina**—B.A. 3/28—U. S. Eng., foot of Front St., Norfolk, Va., main control switchboards and appurtenant equip., Buggs Island Powerhouse, on Roanoke River, approx. 20 mi. downstream from Clarksville, Va. and 18 mi. upstream from the Virginia-North Carolina State line, Serial No. CIVENG 44-110-50-60. CD 1/6.

† **West Virginia**—B.A. 3/28—U. S. Eng., Madison Ave., and 8 St. West, Huntington, Zone 18, three pump stations for Local Protection Proj., Point Pleasant, Serial No. CIVENG 46-022-50-85. Extended date. CD 2/13.

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† **Georgia and South Carolina**—B.A. 3/29—U. S. Eng., Post Office Bldg., Savannah, clearing reservoir, Group II, Clark Hill Proj., Savannah River Basin, Savannah River, Serial Co. CIVENG-09-133-50-3. Extended date. CD 2/28.

† **New York**—B.A. 3/29—U. S. Eng., 80 Lafayette St., New York, Zone 13, maintenance dredging about 48,000 cu. yd. material from Narrows of Lake Champlain, Washington Co., CIVENG-30-075-50-78.

† **New York**—B.A. 3/30—U. S. Eng., Niagara and Bridge Sts., Buffalo, Zone 7, maintenance dredging Black Rock Channel Niagara River Sect., Buffalo Harbor, Serial No. CIVENG-30-023-50-41. CD 10/15/45.

† **New Mexico**—B.A. 3/30—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Fort Sumner, two 15,000 lb. motor-operated radial-gate hoists for the Fort Sumner Diversion Dam, Fort Sumner Proj. Spec. 2929. CD 9/7/44.

† **Virginia**—B.A. 3/30—U. S. Eng., foot of Front St., Norfolk, dredging Southern Branch of Elizabeth River, Norfolk Harbor, Serial No. CIVENG 44-110-50-57.

† **Wisconsin**—B.A. 3/30—U. S. Eng., 1217 Post Office and Custom House, St. Paul, 1, Minn., upper guide wall exten. at Lock and Dam 6, Mississippi River, near Trempealeau. Extended date; adv ENR 3/16. CD 2/24.

† **Arkansas**—B.A. 3/31—U. S. Eng., 300 Broadway, Little Rock 1,100 to 1,500 lin. ft. standard pile dike and 16,000 to 26,000 lin. ft. pile revetment and standard revetment, Pine Bluff, Jefferson, Co., CIVENG-03-050-50-67.

† **Colorado**—B.A. After 4/3—U. S. Eng., P. O. Box 1538 Albuquerque, N. M., Willow Creek Channel imprvt., Station 29 plus 36 to Station 55 plus 83, Creede. CIVENG-29-005-50-11. Extended date. CD 2/24.

† **Florida**—B.A. 4/4—U. S. Eng., P. O. Box 4970, Jacksonville, dredging Entrance Channel basin and portion of barge canal, Canaverial Harbor, Hillsborough Co., Inv. No. CIVENG-08-123-50-77. Bids 2/17 rejected, under CIVENG-08-123-50-64. CD 1/6.

† **Idaho**—B.A. 4/4—Bureau Reclamation, Dpt. Interior, Cascade, clearing part of Cascade Reservoir site north of Arling, located between 9 and 17 mi. north of Cascade. Schedules 1 to 7 (inclusive). Spec. R1-72.

†**Kentucky**—B.A. 4/4—U. S. Eng., 830 W. Broadway, Louisville, Zone 3, 3 pumping plant structures, concrete substructure, brick superstructure walls, and concrete roof deck; 12- to 36-in. discharge pipe lines; 60 in. 5x5 ft. and 8x8 ft. intake; 10 storm water pumps, 3 sewage pumps, with electrical control equipt.; two 300 KVA and one 750 KVA transformer substations; 3 floodwall monoliths, 3-manhole and 2 gatewell alterations, CIVENG 15-029-50-71.

† **Washington**—B.A. 4/4—Bureau Reclamation, Dpt. Interior, 202 N. 4 St., Yakima, drop in Drain A, Station 260 plus 50 Roza Div., Yakima Proj., about 4 mi. southeast of Moxee City, Spec. R1-75. H. T. Nelson, regional dir.

† **Florida**—B.A. about 4/5—U. S. Eng., P. O. Box 4970, Jacksonville, repair south jetty and revetment at Lake Worth Inlet entrance to Palm Beach Harbor, In. No. CIVENG-08-123-59-78. CD 6/9/44.

Montana—B.A. 4/5—State Water Conservation Bd., Armory Bldg., Helena, Lower Musselshell Proj., incl. 31,000 cu. yd. earthwork, 1,100 cu. yd. concrete, 35 tons reinforcing steel, structural steel and iron, 163 MFBM lumber, 735 ft. corrugated let pipe and clay tile, metal gates, and place 3,257 ft. precast concrete pipe, Musselshell and Rosebud Counties. CD 8/3/45.

† **Nebraska**—B. A. 4/5—U. S. Eng., 1709 Jackson St., Omaha 2, Neb., bank protection for Omaha floodwall and Minne Lusa Sewer, Omaha, Douglas Co. Serial No. CIVENG-25-066-50-142. CD 3/6.

† **Ohio**—B.A. About 4/6—U. S. Eng., Madison Ave. and 8th St. W., Huntington 18, W. Va., raising levee, levee protection works, Zoar, Dover Reservoir Proj., Serial No. CIVENG-46-022-50-84.

† **Delaware**—B.A. On or About 4/11—U. S. Eng., 121 N. Broad St., Phila., 1, Pa., dredging approx. 349,000 cu. yd. place measurement material from project channel in Harbor of Refuge, Delaware Bay, 1 to 2 mi. southwest of Atlantic Ocean entrance to Bay at Cape Henlopen. CIVENG-36-109-50-57. CD 1/6.

† **Tennessee**—B.A. 4/11—U. S. Eng., P. O. Box 97, Memphis, Zone 1, construct Marble Bayou Pumping Station of the Memphis, Wolf River and Nonconnah Creek Proj., on riverside of Illinois Central R. R. track and west of intersection of N. 2 St. and Marble Ave., in Memphis, Serial No. CIVENG-40-041-50-114. Plans deposit $15.

† **Ohio**—B.A. About 4/12—U. S. Eng., Madison Ave. and 8 St. W., Huntington 18, W. Va., Black Fork channel rectification, below Charles Mill Dam, Muskingum River Reservoirs, Serial No. CIVENG-46-022-50-31.

▲ **Florida**—B.A. 4/14—U. S. Eng., 575 Riverside Ave., Jacksonville, Zone 1, dredging approx. 15,000,000 cu. yd. Fulton-Dames Point, new cut-off section of Main St. Johns River ship channel between Jacksonville and ocean, Inv. No. CIVENG-08123-50-68. $2,500,000. Plans deposit $10. CD 11/24/43.

† **Ky., Louisville**—B.A. About 4/18—U. S. Eng., 830 W. Broadway, Zone 3, constr. Louisville Flood Protection Works, Sect. E, incl. levee embankment, diversion channels, closure structure and storage vault, sewers, drains, drainage structures, manholes, catch basins, sluice gates, and flap gates, road surf., CIVENG 15-029-50-78. Plans deposit $15.

▲† **Oregon**—B.A. 4/20—U. S. Eng., Pittock Block, Portland, Zone 5, completing earth embankment, dam structure and construct concrete spillway structure, incl.

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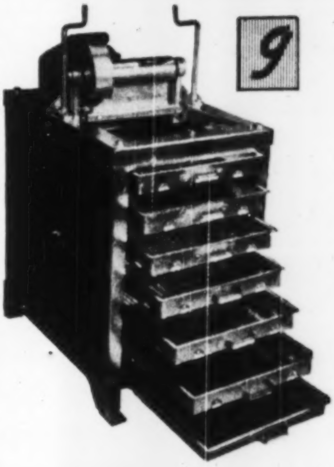

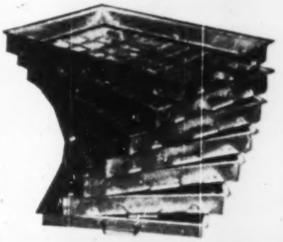

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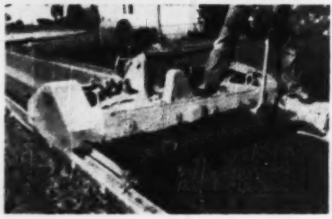

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construction of appurtenances for Lookout Point reservoir on Middle Fork Williamette River, 23 mi. southeast of Eugene, Lane Co. CIVENG-35-026-50-250. $20,000,000. CD 2/7.

▲ † **Idaho**—B.A. 4/25—U. S. Eng., 19 E. Poplar St., Walla Walla, Wash., excavation and embankment for constr. diversion channel, cofferdams, main dam and spillway for Lucky Peak Dam on Boise River near Boise. CIVENG 45-164-50-105.

† **North Dakota**—B.A. 4/28—U. S. Eng., Fort Lincoln, P. O. Box 300, Bismarck, stilling basin and powerhouse fdns., Garrison Dam and Reservoir, Riverdale Serial No. CIVENG-32-015-50-62. CD. 6/1/44.

† **South Dakota**—B.A. On Or About 5/17—U. S. Eng., 1709 Jackson St., Omaha 2, Neb., earthwork, Stage III, for Fort Randall Dam, near Lake Andes, or Missouri River, approx. 80 mi. northwest of Yankton and 7 mi. south of Lake Andes, Charles Mix and Gregory Counties, Spec. No. CIVENG-25-066-50-140.

LOW BIDDERS

† **Texas**—U. S. Eng., 606 Santa Fe Bldg., Galveston, Mar. 1, maintenance dredging in Houston Ship Channel Turning Basin, near Houston, from Atlantic, Gulf & Pacific Co., Citizens State Bank Bldg., Houston, $125,985. CD 6/9/44.

AIRPORTS

BIDS ASKED

† **Neb., Lincoln**—LANDING SYSTEM—B.A. 3/28—Civil Aeronautics Admin., City Hall, Kansas City, Mo., instrument landing sys. at Muricipal Airport.

† **N. J., Fort Dix**—HANGAR, etc.—B. A. About 4/1—Dpt. Armory, Armory Drive, Trenton, hangar and administration bldg. at Maquire Air Base $575,000, water and sewer lines at Maquire Air Base $100,000. CD 2/17.

† **S. D., Rapid City**—OPERATIONS, CONTROL TOWER, etc.—B. A. 4/4—U. S. Eng., 1709 Jackson St., Omaha 2, Neb., combination operations, control tower and crash truck bldg. at Rapid City Air Force Base, Weaver, Serial No. 25-066-50-6. Extended date. CD 3/1.

† **Calif., Muroc**—ELECTRICAL DISTRIBUTION SYSTEM—B.A. 4/20—U. S. Eng., 7151 S. Figueroa St., electrical distr. sys. at Mruoc Air Force Base, $100,000-$200,000. CD 10/26.

CONTRACTS AWARDED

† **Mass., Squantum** — CREWS GALLEY—First Naval Dist. 495 Summer St., Boston, crews galley addns., alterations, Naval Air Station, Bldg. 14, Spec. 13133, to Wexler Constr. Co., 2 Elm Place, Brookline, $68,274, Bids 2/28. CD 2/17.

PUBLIC BUILDINGS

BIDS ASKED

Mass., Attleboro—SCHOOL—B.A. 3/27—City, Supt. Schools, 2 story bsmnt., brick, steel Junior High School, Brownell Property, $700,000. Architects' Collaborative, 1430 Massachusetts Ave., Cambridge archts. CD 6/30.

B. C. Creston—HOSPITAL—B. A. 3/27—Secretary, Creston Valley Hospital Assn., Creston, 2 story 40 bed rein.-con. hospital, Approx. $225,000. Plans deposit $50. Sharp & Thompson, Berwick, Pratt, 1553 Robson St., Vancouver, archts.

▲ **Conn., New Britain**—HOUSING—B.A. 3/28—City of New Britain Housing Auth., Edward Szozepanik, chn., 16 Armistice St., 180 family units, MR-12 Extension, Corbin Ave. $2,000,000. Henry Ludorf, 100 Pearl St., Hartford, archt. CD 3/7.

Ill., St. Charles—POWER PLANT—B. A. 3/28—State of Illinois, Springfield, general work, machinery and equip., power piping, heating, plumbing, insulating and electrical work for rehabilitation power plant at Illinois State Training School for Boys. $250,000. CD 4/9/45.

Mich., Coldwater—NURSERY—B.A. 3/28—Mich. Dpt. Admin., 115 A State Office Bldg., Lansing, 2 unit, masonry, concrete, structural steel nursery for Coldwater State Home Training School. $864,000. Plans deposit $25. Harley Ellington & Day, 153 E. Elizabeth St., Detroit, archts. CD 12/1.

Minn., Slayton—SCHOOL—B.A. 3/28—Bd. Educ., S. H. Stephenson, clk., two 2 story school addns. $400,000. Plans deposit $20. Pass & Rockey, Mankato, archts. G. M. Orr Eng. Co., 1004 Marquette Ave., Minneapolis, engr. CD 3/2.

N. C., Concord—HOSPITAL—B.A. 3/28—Cabarrus Hospital, C. A. Cannon, chn., Concord, 130 bed hospital addn. Plans deposit $100 general, $50 other contracts. J. N. Pease & Co. Inc., 119½ E. 5 St., Charlotte, engr. and archt. CD 10/2/47.

N. C., Greenville—HEALTH, etc.—B.A. 3/28—Eastern Carolina Teachers College, F. D. Duncan, bus. mgr., Greenville, 2 story, 1,022,37 cu. ft. health and physical education bldg., 17,500 cu. ft. pipe tunnel. Plans deposit $50 general, $25 plumbing, heating and electrical work. Extended date. Eric G. Flannagan, McCoin Bldg., Henderson, archt. and engr. CD 2/1.

O., Cambridge—HOSPITAL—B.A. 3/28—Guernsey Memorial Hospital, Inc., C. L. Moore, pres., Courthouse. Contr. 1, general contract hospital. Contr. 2, electrical work; Contr. 3, plumbing, drainage, gas piping, heating, ventilating, air-conditioning. Plans deposit

$100 general, $50 others. L. D. Schmidt & Son, Professional Bldg., Fairmont, W. Va., archts. CD 9/4/45.

▲† **O., Cincinnati**—HOSPITAL—B.A. 3/28—Veterans Admin., Vermont Ave. between H and I Sts. N. W. Wash. 25, D. C., Hospital Bldg. 1, approx. 4,526,000 cu. ft.; Nurses and Staff Apartment Bldg. 3, approx. 152,000 cu. ft.; Attendants Quarters Bldg. 5, approx. 35,000 cu. ft.; Station Garage Bldg. 6, approx. 62,000 cu. ft.; Laundry Bldg. 7, approx. 120,000 cu. ft.; Boiler House Bldg. 8, approx. 167,000 cu. ft.; Radial Brick Chimney 9, approx. 125 ft. high; Underground Wet Salt Storage Basins 10, approx. 1,300 cu. ft.; Underground Soft Water Reservoir 11, approx. 3,400 cu. ft.; Steel Flag Pole 12, approx. 75 ft. high, etc., Spec. No. 5000, Proj. No. 2887. CD 12/2.

Wis., Milwaukee—SCHOOL—B.A. 3/28—Bd. School Directors, 1111 N. 10 St., 2nd story 1 story L-shaped 145x180 ft. steel, concrete, brick Manitoba School addn. $600,000. Plans deposit $50. G. E. Wiley, c/o owner, archt. CD 7/11.

▲ **Kan., Great Bend**—SCHOOL—B.A. 3/29—Bd. Educ., high school. $1,256,700. CD 1/19.

Mass., Newton—GARAGE—B. A. 3/29—City, Mayor's Office, City Hall, brick, concrete municipal garage, to house Police Dpt. motor vehicles. Approx. $68,000. Gustav A. Hagen, 131 Otis St., archt. CD 12/9.

▲ **Minn., South St. Paul**—SCHOOL—B.A. 3/29—Bd. Educ., C. J. Swedberg, clk., 2 and 3 story Junior High School, $1,000,000. Plans deposit $30. Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, archts. CD 3/31.

N. Y., North Merrick—SCHOOL—B.A. 3/29—Bd. Educ., Union Free School Dist. 29, North Merrick, school. $740,000. Plans deposit $50. F. F. Wiedersum, 240 Rockaway Ave., Valley Stream, archt.

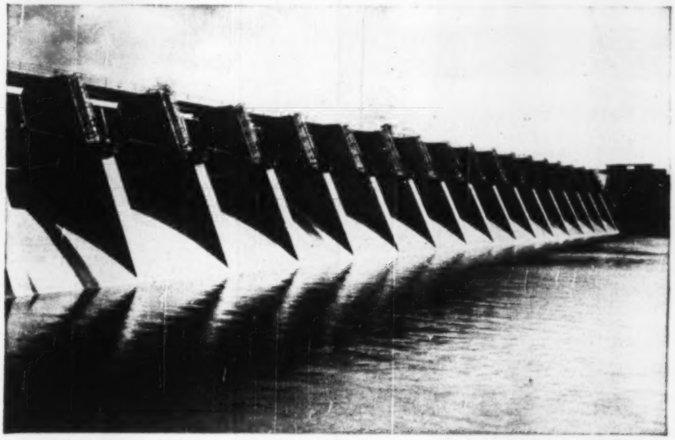
Pa., Nanticoke—BOILER PLANT—B.A. 3/29—Dpt. Property & Supplies, 18 and Herr Sts., Harrisburg, boiler plant at Nanticoke State Hospital. Plans deposit $10 heating and plumbing, $5 general, $2.50 electrical work. John P. Gilboy, Jr., Bowman Bldg., Scranton, engr.

† **Tennessee**—HOUSING, etc.—B.A. 3/29—U. S. Eng., P. O. Box No. 1070, Nashville, Zone 1, Dale Hollow permanent housing and comfort station, in Dale Hollow Reservoir, approx. 5 mi. east of Celina, Clay Co., Serial No. CIVENG-40-058-50-35. CD 2/27.

N. B., Chatham—HOUSES—B. A. 3/29—P. J. Mangan, engr., c/o Central Mortgage & Housing Corp., 1032 Gottingen St., Halifax, N. S., 75 houses at D.N.D. married quarters at Air Station. Approx. $560,000. Plans deposit $10.

† **Del., Lewes**—QUARTERS—B. A. 3/30—U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C., conversions to family quarters at Fort Miles. Eng-49-080-50-14 (18).

N. Y., Deposit—HIGH SCHOOL—B.A. 3/30—Bd. Educ., Central School Dist. 1, Deposit, Junior and Senior High School. $950,000. Plans deposit $40. Archi-



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bald F. Gilbert, 358 Fifth Ave., New York, Zone 1, archt. CD 7/25/47.

▲ **O., Hamilton**—SCHOOL—B.A. 3/30—Bd. Educ., 322 Dayton St., 28-room Harrison Monroe School. $1,116,000. CD 12/1.

O., Marysville—HOSPITAL—B. A. 3/30—Bd. Trustees, Union County Memorial Hospital, c/o County Comrs., 1 story modern 35-bed cross-shaped hospital. $500,000.

Utah, Morgan—SCHOOL—B.A. 3/30—Morgan County School Dist., c/o Ella Hemming, clk., Morgan, Morgan Grade School. $250,000. Karl L. Krusmark, 1st Security Bank Bldg., Ogden, archt.

† **Wash., Ephrata**—OFFICE—B.A. 3/30—Bureau Reclamation, Dpt. Interior, Ephrata, office bldg., Spec. 2926. Michael W. Straus, comr.

Ga., Jonesboro—SCHOOLS—B.A. 3/31—Clayton Co., Jonesboro High School, Forest Park High School and North Clayton High School. Approx. $250,000 each. Plans deposit $50 each. Bothwell & Nash, 207 Roswell St., Marietta, archts. CD 6/22/46.

N. J., Somerville—ADMINISTRATION—B.A. 3/31—Bd. Freeholders Somerset Co. Courthouse, county administration bldg., Bridge and High Sts. Plans deposit $50. P. C. Van Nuys & Son, Jay C. Van Nuys, 1 W. Main St., archts. CD 11/1/46.

N. C., Shelby—HOSPITAL—B.A. 3/31—Bd. Trustees Cleveland Co., Earl Hamrick, chn., Shelby, hopsital. Plans deposit $30 general, $20 plumbing, heating, electric, elevators. Walter Hook & Assocs., Inc., 305 W. 4 St., Charlotte, archt. CD 7/19/45.

▲ **N. J. New Brunswick**—HOUSING—B.A. April—New Brunswick Housing Auth., 200 low rent dwellings, $2,000,000. Alexander Merchant & Son, 1 Elm Row, archts. CD 8/3/44.

Fla., Coral Gables—BUS TERMINAL—B.A. About 4/1—City, bus terminal. Walter Butler Co., Coral Gables First Natl. Bank Bldg., archt.

▲ **Fla., St. Petersburg**—HOSPITAL—B.A. About 4/1—City, Mound Park Hospital, $2,500,000. De Witt & Swank, 2025 Cedar Springs Rd., Dallas, Tex., archts. CD 1/7/49.

Ga., Atlanta—HIGH SCHOOL—B.A. About 4/1—Fulton Co. Bd. Educ., Courthouse, Lakewood Heights High School, $500,000. Plans deposit $40. Cooper, Bond & Cooper, Henry Grady Bldg., archts. CD 1/23.

Ky., Henderson—SCHOOL—B.A. 4/1—Henderson Co. Bd. Educ., high school, $750,000. George F. Mahoney, Columbian Mutual Tower, Memphis, Tenn., archt. CD 12/13.

Neb., Wayne—DORMITORY—B.A. 4/1—State Normal Bd., Capitol Bldg., Lincoln, mens dormitory at Wayne State Teachers College. $500,000.

N. Y. Syracuse—HOUSING—B.A. 4/3—Syracuse Housing Auth., 301 E. Washington St., Contr. 1, general contract incl. street and yard imprvs., Contr. 2, electrical work, Contr. 3, plumbing, Contr. 4, heating for Syracuse Housing Proj. N.Y.S. 44, bounded by Oak Ct., Forbes Ave., Beacon Rd., Hazelhurst Ave., New St. and Taft Ave. Plans deposit $25.

N. C., Rockingham—HIGH SCHOOL—B.A. 4/3—Richmond Co. Bd. Educ., F. B. McLeod, supt., Rockingham, Rohannen High School, East Rockingham. J. J. Croft, Jr., Asneboro, archt. CD 6/6.

O., Hamilton—HOSPITAL—B.A. 4/3—Butler Co. Comrs., Citizens Bank Bldg., 4 story, bsmnt., hospital. $500,000. Mueller-Hair & Hetterich, Anthony Wayne Hotel, and Samuel Hannaford & Sons, Dixie Terminal Bldg., Cincinnati, archts. O. W. Motz, 920 E. McMillan St., Cincinnati, engr. CD 12/1.

Utah, Salt Lake City—SCHOOL—B.A. 4/4—Bd. Educ., 440 East First South St., Parley's School, 2291 S 20 East St. $400,000. Young & Ehlers, 826 Continental Bank Bldg., archts. CD 5/13.

P. E. I., Summerside—HOUSES—B. A. 4/4—P. J. Mangan, engr., c/o Central Mortgage & Housing Corp., 1032 Gottingen St., Halifax, N. S., 105 houses at D.N.C. married quarters at Air Station. Approx. $785,000. Plans deposit $10. CD 1/13/49.

N. C., Asheville — HOUSING — B.A. 4/5 — City, slum clearance, 18 bldgs. containing 96 dwelling units and one administration bldg. Six Associates, Inc., Box 1950, engr. and archt. CD 11/18.

La., Lacassine—SCHOOL—B.A. 4/6—Jefferson Davis Parish School Bd., Jennings, Lacassine School. Plans deposit $50. Barron, Heinberg & Brocato, 512 Guaranty Bank Bldg., Alexandria, archts.

† **Vt., St. Albans**—BUILDINGS, etc.—B.A. 4/6—U. S. Eng., Army Base, Boston 10, Mass., buildings, utilities, Serial No. Eng-19-016-50-23. Plans deposit $60. CD 1/20.

R. I., Providence—HOUSING—B. A. 4/7—Providence Housing Auth., Joseph P. Carroll, chn., 263 Chad Brown St., 24 two story bsmnt., 278 family unit brick, frame garden apartments, Admiral Terrace Proj. RI 1-1A. Plans deposit $100. Creer, Kent, Mather, Cruise & Aldrich, 323 Industrial Trust Bldg., archts. CD 11/17.

N. C., Hamlet—SCHOOL—B. A. 4/10—Hamlet School Bd., H. E. Keyser, supt., Hamlet, school. Plans deposit $50 general, $25 mechanical work. John James Croft, Jr., Asheboro, archt. CD 1/13.

† **Colorado**—SYNCHRONOUS CONDENSER, etc.—B.A. 4/11—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, furnishing, del. f.o.b. cars Brush, out-door type synchronous condenser with control equip. for Beaver Creek substation Colorado-Big Thompson Proj., Spec. 2929. L. N. McClellan, ch. engr.

† **Alaska, Naknek**—MILITARY INSTALLATION—B.A. 4/12—U. S. Eng., (APO 942, c/o PM, Seattle, Wash.) Anchorage, complete Military Installation to be known

(Continued on page 318)

CLYDE

*Portable**

BUILDERS TOWERS

SAVES ^*many* COSTLY MAN-HOURS

Easily moved from job to job!

No wasted time!

No loss of material!

- Self raising. Clyde Towers up to 100 ft. are assembled and cables reeved while on ground.
- Easy to handle. Tower quickly dismantles into 10 ft. sections.
- Special equipment. Concrete hopper may be substituted for elevator platform.
- Ton loads. Quickly and safely hoist ton loads at speeds up to 178 feet per minute.

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Speed Materials Handling!

*Clyde Portable Builders Towers offer many money-saving and time-saving advantages. Time saved in the erection and dismantling, as compared to other type elevators, effects large savings **measurable in cold cash!** Clyde Towers are built for long life, dependable performance, and eliminate maintenance and replacement costs of timber tower. But more than that, Clyde Portable Builders Tower are **safety engineered** to minimize construction job hazards. No acrobats or dare-devils are needed to erect a Clyde . . . it's assembled on the ground and raised into position with its own hoist!

For safety, for convenience, for large savings measurable in cold cash, get a Clyde**!** **You can expect,** AND GET, more when you buy a Clyde portable builders tower.

Check these Clyde Features

- ✓ **Safety brake automatically locks load in in case of cable faiure.**
- ✓ **A 2,000 lb. capacity tower derrick available as extra equipment.**
- ✓ **May be transported on trailer wheels or loaded on a truck.**

For Complete Facts write for Bulletin A-11

Tower hoist quickly and easily raises tower into position. No outside crane is needed. Clyde Portable Builders Towers are fast, safe, convenient to erect.

Tower is quickly and easily assembled, and cable reeved while tower is on ground. Only two men are required to handle and erect complete.

Tower is easily and quickly lowered and dismantled for transport. May be loaded on truck or towed on trailer wheels which attach to tower base.

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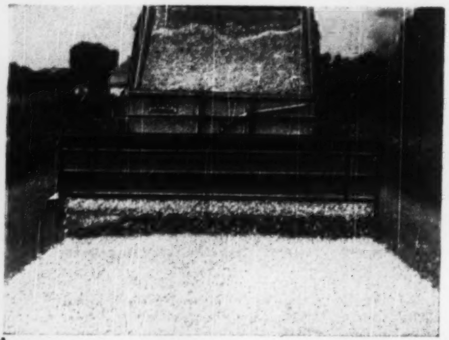

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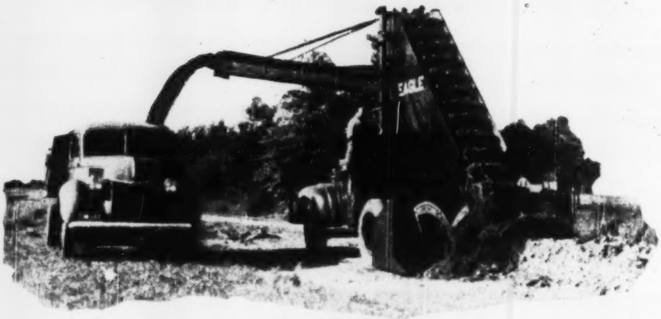

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JAW CRUSHERS · IMPACT BREAKERS
PULVERIZERS · CONVEYORS · LOADERS

(Continued from page 316)

as Naknek Proj., incl. bachelor officers' quarters, noncommissioned officers' quarters, airmen's quarters, central heating and power plant, operations bldg., warehouse and cold storage, veicle warm storage, mess hall, recreation bldg., dispensary and admin. bldg., P. O. L. Station storage, outside utilities and roads, near here, Inv. No. S95-507-50-11. Plans deposit $100.

▲ **N. Y., Glens Falls**—HIGH SCHOOL—B.A. 4/12—Bd. Educ., Union Free School Dist. 1, Glens Falls, Senior High School. $1,142,000. Plans deposit $50. Marcus T. Reynolds & R. H. Parks, Rogers Bldg., archts. CD 12/13/46.

† **Colorado**—GENERATOR—B.A. 4/13—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, installing generator for Pole Hill Power Plant, Colorado-Big Thompson Proj., approx. 10 mi. east of Estes Park, Spec. 2931. L. N. McClellan, ch. engr.

Ia., Grundy Center—HOSPITAL—B.A. 4/13—Grundy Co., Grundy County Memorial Hospital. Charles Altfillisch, 126½ W. Water St., Decorah, archt. CD 3/5/47.

Ga., Swainsboro—HOSPITAL—B. A. About 4/15—Emanuel Co., 50 bed hospital. Approx. $300,000. Plans deposit $50. Willis Irvin & Helen Irvin, 722 Greene St., Augusta, archts. CD 3/9.

Va., Lynchburg—HIGH SCHOOL—B.A. About 4/15—City, Lynchburg, high school. Approx. $250,000. Extended date. Pendleton S. Clark, Krise Bldg., archt. CD 11/29.

N. Y., Port Washington—HOUSING—B.A. 4/15—North Hempstead Housing Auth., Town Hall, Plandome Rd., Manhasset, 70 frame dwelling units, $750,000. William Lescaze, 211 E. 48 St., New York, archt. CD 8/17.

† **Calif., Los Angeles**—KITCHEN etc.—B.A. 4/18—Veterans Admin., Vermont Ave. between H and I Sts. N.W., Wash. 25, D. C., Kitchen and Dining Hall Bldg. 300, for veterans administration center, Spec. 5010, Proj. 2868. CD 1/9, under L.B.

▲† **Ill., Chicago**—HOSPITAL—B.A. 4/18—Veterans Admin., Vermont Ave. between H and I Sts. N. W. Wash., 25, D. C., research hospital for Veterans Administration at Erie, Huron Fairbanks Ct. and McClurg Sts., $6,000,000. CD 2/3.

Conn., Ansonia—HOUSING—B.A. About 4/20—City Ansonia Housing Auth., Ansonia, 50 family units, Webb Memorial Park. $480,000. Henry T. Moeckel & Son., 35 Hillcrest Ave., Naugatuck, archts. CD 9/12.

† **Arizona and Nevada**—RADIO TRANSMITTER-RECEIVER SET, etc.—B. A. 4/20— Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Phoenix, Ariz., 2 frequency modulated radio transmitter-receiver sets, 1 for Phoenix substation, and other for Mesa substation Davis Dam Proj., Spec. 2939. L. N. McClellan, ch. engr.

† **Colorado**—TRANSFORMERS, etc.—B. A. 4/20—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Longmont, transformers for Leyner substation, Colorado-Big Thompson Proj., Spec. 2937. L. N. McClellan, ch. engr.

† **Washington**—LINE TRAPS—B. A. 4/20—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars Odair or shipping point, line traps for Grand Coulee Power Plant, Columbia Basin Project., Spec. 2940. L. N. McClellan, ch. engr.

▲† **N. C., Salisbury**—HOSPITAL—B.A. 4/25—Veterans Admin., Munitions Bldg., Wash. 25, D. C., approx. 280,000 cu. ft. Administration Bldg. 1; approx. 2,216,000 cu. ft. General Medical and Surgical Bldg. 2; approx. 1,155,000 cu. ft. Admissions Bldg. (Regular) 3; approx. 1,142,000 cu. ft. Admissions Bldg. (special) 4; approx. 658,000 cu. ft. Central Cafeteria and Kitchen Bldg. 5; approx. 1,348,000 cu. ft. Recreation Bldg. 6; approx. 199,000 cu. ft. Occupational Therapy Bldg. 7; approx. 689,000 cu. ft. Disturbed Bldg. 10; approx. 512,000 cu. ft. Infirm Bldg. 11; approx. 27,000 cu. ft. Manager's Residence Bldg. 12; approx. 122,000 cu. ft. Apartment 13; each approx. 33,000 cu ft. two duplex Quarters Bldgs. 14 and 14; approx. 66,000 cu. ft. Attendants Bldg. 15; approx. 156,000 cu. ft. Laundry Bldg. 16; approx. 221,000 cu. ft. Warehouse-Garage Bldg. 17; approx. 360,000 cu. ft. Boiler House Bldg. 18, incl. 160 ft. radial block chimney; approx. 70,000 cu. ft. Chapel Bldg. 19; approx. 250,000 gal. Elevated Steel Water Tank 20; approx. 26,000 cu. ft. Patients' Tunnel "A"; approx. 78,000 cu. ft. Patients' Tunnel "B"; approx. 20,000 cu. ft. Patients' Tunnel "C"; approx. 33,000 cu. ft. Patients' Tunnel "E"; approx. 19,000 cu. ft. Patients' Tunnel "F"; approx. 20,000 cu. ft. Patients' Tunnel "G"; approx. 32,000 cu. ft. Patients' Tunnel "H" etc. concrete fdns., brick faced exterior walls with stone trim and backed with hollow tile, rein.-con. floors, and built-up roofs, constr. Walter Hook & Assoc. Inc., 305 W. 4 St., Charlotte, and Wm. H. Deitrick, Inc., 115 W. Morgan St., Raleigh, archts. Wm. C. Olsen, 5 Exchange Pl., Raleigh, engr. CD 2/28.

Ont., Barriefield — BARRACKS — B.A. 4/26 — J. D. McCarthy, secy., Canadian Commercial Corp., 70 Lyon St., Ottawa, main barrack block, Barriefield Military Camp; Tender No. G-3-29-583. Approx. $300,000. Plans deposit $100.

▲ **New Jersey**—BUILDINGS, etc.—B.A. 4/27—U. S. Eng., 180 Lafayette St., New York 13, N. Y., bldgs and utilities near Red Bank, No. Eng-30-075-50-77. $1,000,000.

N. C., Henderson—COURTHOUSE, etc.—B.A. 4/27—Bd. Comrs. Vance Co. Bd. Comrs., F. H. Ellington, chn. Henderson, expansion, enlargement courthouse and new jail. Approx. $250,000. John J. Rowland, 129 W. Gordon St., archt. CD 11/21.

▲ **Tex., Austin**—CLASSROOMS—B. A. 4/27—University of Texas, c/o Bd. Regents, Austin, three 4 story rein.-con. frame, hollow tile, brick, stone exterior classroom bldgs., pier and beam fdns., air-conditioning. Approx. $1,000,000 each Bldgs. 1 and 2, $948,000 Bldg. 3. Staub & Rather, 8214 Virginia Ave., Houston, archts., Francis J. Niven, 3908 Main St., Houston, engr., Plans deposit $40 each general, $25 each mechanical work; CD 1/20; 5 story bsmnt. 71 x 169 ft., brick, hollow tile, stone, concrete frame pharmacy bldg., concrete pier and beam fdn., $1,250,000. Atlee B. & Robert M. Ayres, Transit Tower, San Antonio, archts., Mark Lemmon, 121½ Main St., Dallas, consult. archt.; M. Staley, Chandler Bldg., San Antonio, and Matthews & Kenan, 1908 Transit Tower, San Antonio, engrs. Plans deposit $40 general, $25 mechanical work. CD 5/16.

Fla., St Petersburg—POLICE, etc.—B.A. About 5/15—police bldg., and jail. $400,000. Associated Architects & Engineers, 213-216 City Hall Bldg., archts. CD 10/21/46.

Minn., St Cloud—LIBRARY—B.A. About 5/1—State Dpt., Admin., R. T. Peterson, dir. Purchases 19 State Capitol, St. Paul, 3 story, brick, concrete library, at State Teachers College. $500,000. L. C. Pinault, St. Cloud, archt. CD 6/30/49.

† **Tenn., Oak Ridge**—RESEARCH LABORATORY—B.A. 5/4—U. S. Atomic Energy Comm., P. O. Box E. Attention: R. J. Dunbar, Engr. Div., Oak Ridge, 2 story, approx. 161,000 sq. ft. research laboratory, Bldg. 1 at Oak Ridge National Laboratory, X-10 area, Roane Co., Inv. No. 401-50-8A. CD 2/6.

Ala., Opelika—HOSPITAL—B.A. About 6/1—Lee Co., c/o Watson T. Smith, Opelika, hospital. $750,000. CD 12/9.

▲† **N. M., Los Alamos**—LABORATORY—B. A. 6/20—U. S. Atomic Energy Comm., Los Alamos, 2 story, bsmnt., rein.-con., steel type laboratory, air-conditioning, etc., Inv. 291-50-59. $10,000,000-$12,000,000. Plans deposit $100. CD 2/24.

LOW BIDDERS

Va., Newport News—HIGH SCHOOL—City rejected bids Feb. 8. Huntington High School alterations, addns. L. B. $249,910. CD 2/15. under LB.

Va., Radford—TRAINING SCHOOL—Radford College, Radford, Feb. 21, training school at Radford College, Woman's Div. of Virginia Polytechnic Institute, from Trinkle & Dobyns, Dublin. $267,000. CD 1/18.

CONTRACTS AWARDED

▲ **Md., Baltimore**—DORMITORY, etc.—State of Maryland Dpt. P. Imprvs., John B. Funk, ch. engr., 506 Park Ave., 3 story, bsmnt., 46x151 ft., steel, stone, rein.-con. Men's Dormitory Bldg. 24, grd. and 1st floor irregular-shaped, stone, concrete steel gymnasium and classroom bldg., enclosed swimming pool wing, 3 story, bsmnt., 46x151 ft. rein.-con. stone, steel Womens Dormitory Bldg. 11, all above at Morgan State College, to John K. Ruff, 100 W. 22 St., Zone 18. $1,193,335. Bids 2/9. CD 2/14. under LB.

Mass., Bridgewater—SCHOOL—Town School Bd. 2 story, bsmnt., brick, steel high school, to John Hamre & Son, 55 Buckingham St., Quincy. $789,000. Bids 2/24. CD 3/8. under LB.

Que., Lachute—SCHOOL—Roman Catholic School Comm., 21 Bedard Blvd. 2 story, bsmnt. 48x245 ft. concrete, steel, brick masonry 26 classroom school, to R. Matte, 4387 Colbrooke St., Montreal. $400,000. CD 12/6. under LB.

▲ **Que., Montreal North**—HOUSING—Central Mortgage & Housing Corp., 1247 Guy St., Montreal. 216 dwelling units Proj. Que. 49-B, to Alex Duranceau Ltd., 4 Notre Dame St. E., Montreal. Approx. $1,022,400. Bids 2/23. CD 2/7.

COMMERCIAL BUILDINGS

BIDS ASKED

Md., Baltimore—SCHOOL—B.A. 3/29—Eiser & Akers, mech. engrs., 916 N. Charles St., Baltimore, 2 and 4 story, brick, stone school, convent and rectory, for St. Michaels R. C. Church, Belair Rd. and Willow Ave. Murphy & Locraft, 1518 P St. N.W., Wash., D. C., archts. Saxe, Williar & Robertson, 130 W. Hamilton St., struct. engrs. CD 10/28.

Ont., Toronto—RED CROSS—B.A. 3/31—Page & Steele, archts., 72 St. Clair Ave. W., 5 story 60x87 ft. with 3 story 20x27 ft. boiler room, steel, brick red cross bldg., 87 Bloor St. E., for Canadian Red Cross Society, 95 Wellesley St. E. Approx. $550,000.

Ala., Birmingham—OFFICE—B.A. About 4/1—Alabama Power Co., 600 N. 18 St., 12 story 50,000 sq. ft. office addn. Approx. $250,000. Jack Smith, Frank Nelson Bldg., archt.

La., New Orleans—Y.M.C.A. BLDG.—B.A. 4/4—Y.M.C.A., c/o Jones & Roessle, archts., Maison Blanche Bldg., dormitory, gymnasium Y.M.C.A. addn. $500,000. CD 12/16.

Va., Bristol—HOSPITAL—B.A. 4/5—King's Mountain Memorial Hospital, c/o Dent & Aydelott, archts., 1st Natl. Bank Bldg., Memphis, Tenn., hospital. Extended date. CD 2/20.

▲ **Ia., Cedar Rapids**—HOSPITAL—B.A. 4/12—St. Luke's Methodist Hospital, hospital addn. $2,225,000. Ellerbe & Co., First National Bank Bldg., St. Paul, Minn., archts. CD 12/27/48.

S. C., Charleston—ACADEMIC, etc.—B.A. 4/14—The Citadel, Hampton Park, academic bldg. and apartment. $600,000. Plans deposit $20. Lockwood-Greene Engineers, Spartanburg, engrs. CD 6/14.

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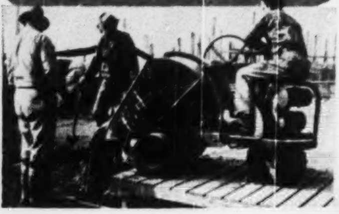

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STRONGER FRAME... GREATER STABILITY... Lower load center of gravity—wider wheel tread with dual tires. Shorter wheelbase—only 42"—permitting use on standard 5' runways.

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Overall length 82". Overall width—single wheels 36"; duals 44". Wheels, pressed steel, split rim (all interchangeable). Tires, 400-8 (wheelbarrow size). Drive, automatic clutch and variable speed changer. Steering, full 360° rotating drive mount. Ball bearing support. (Turns in its own radius.) Brakes, contracting on load wheels.

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▲ **Tenn., Kingsport**—HOSPITAL—B.A. About 5/15—Holston Valley Community Hospital, Kingsport, hospital addn. $1,250,000. Charles H. McCauley & Assoc., Jackson Bldg., Birmingham 3, Ala., engrs. and archts. CD 11/7.

▲ **Tenn., Memphis**—HOSPITAL—B.A. 5/31—Le Bonheur Childrens Hospital, c/o J. Frazer Smith, Inc., archt., Goodwyn Institute Bldg., hospital. $2,070,000. CD 2/14.

SOON LETS CONTRACT

Mass., Medford—COLLEGE UNIT—Bouve-Boston School of Physical Educ., 105 S. Huntington Ave., Brookline, soon lets contract 2 story, brick, steel college unit, Tufts College Campus, $250,000. Bogner & Richmond, 1430 Massachusetts Ave., Cambridge, archts. CD 1/13.

Pa., Hollidaysburg—HOME FOR AGED—Allegheny Conference of Lutheran Churches, 2711 Furnace Ave., Altoona, soon lets contract 2 story, bsmnt., brick, steel home for aged. $310,000. Hunter, Caldwell & Campbell, 3801 5 Ave., Altoona, archts. CD 6/17.

Pa., Meadville—SCHOOL—St. Agathas Roman Catholic Church, Meadville, soon lets contract 1 story, 85x120 ft., brick, tile parochial grade and high school addn. $250,000. Oscar E. Brenot, 919 G. Daniel Baldwin Bldg., Erie, archt.

LOW BIDDERS

Mass., Haverhill—Y. M. C. A. BLDG.—Y. M. C. A., Winter St., Feb. 24, Y. M. C. A. addns., alterations, Winter St., from Morris Constr. Co., 219 Central St., Lowell. **$249,975.** CD 2/10.

Neb., Beatrice—CHURCH—St. Johns Lutheran Church, Beatrice, Feb. 27, general contract church, from Olson Const. Co., 410 S. 7 St., Lincoln, **$284,973.** CD 6/18/48.

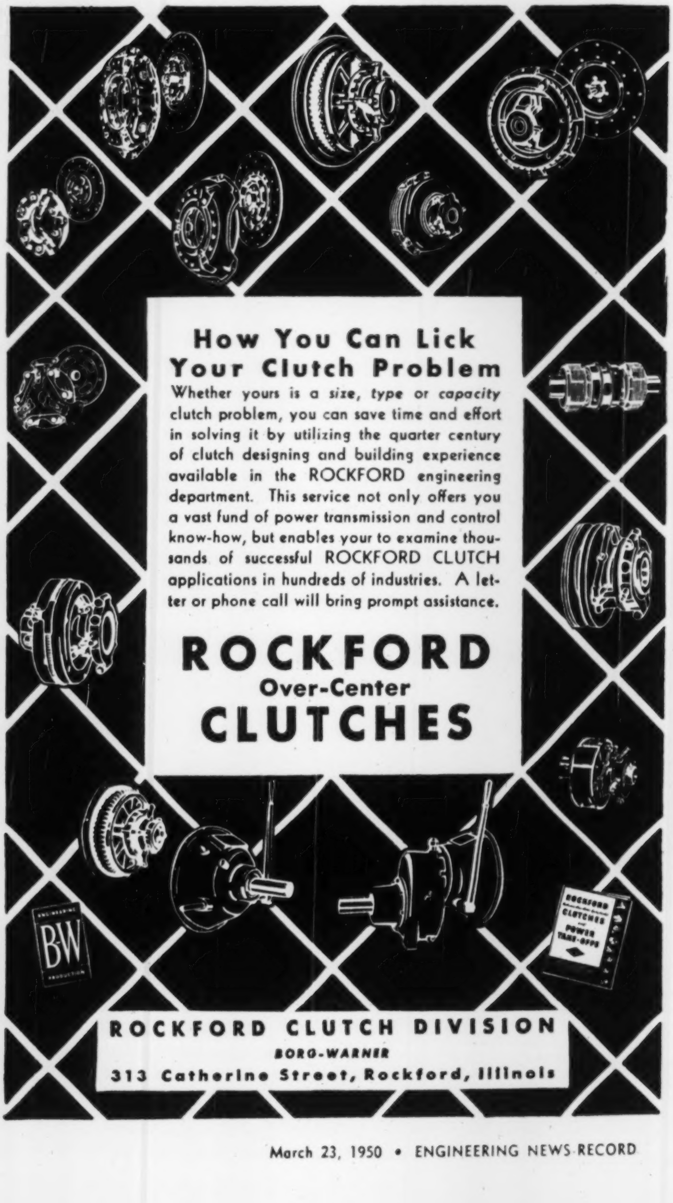
N. C., Morganton—HOSPITAL—Bd. Trustees Grace Hospital, Inc., Morganton, Feb. 23, general contract 40-bed hospital alterations, addns., from W. R. Patton Co., Morganton, **$334,541.** CD 2/17.

CONTRACTS AWARDED

Ala., Birmingham—APARTMENT—Marvin Warner & Joseph Kanter, c/o Pembleton & Mims, archts., Title Guarantee Bldg., apartment, to J. F. Holley, 905 6 Ave. N. Approx. **$300,000.** Bids 11/8. CD 10/31.

Fla., Ft. Lauderdale—HOMES—Miami Gardens, Inc., c/o Pamarrow Turner, archt., 620 N.E. 125 St., North Miami, 70 homes. Owner builds. Approx. **$350,000.**

Fla., Miami Beach—ATHLETIC CENTER—Community Holding Corp., c/o contractor, athletic center, to Sanford Kay Constr. Co., 420 Lincoln Rd. Approx. **$500,000.** (Correction—name of contractor.) CD 2/10, under CA.



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Fla., North Miami—HOMES—Johnson-Strasser Constr. Corp., Chamber of Commerce Bldg., Miami, 32 homes. Owner builds, **$250,000.**

Fla., Tampa—APARTMENT—Lincoln Village c/o contractor, 11 apartment bldgs. for colored to Paul Smith Constr. Co., 310 N. Rome Ave. Approx. **$300,000.**

Ill., Chicago—CHURCH—Church of Epiphany, Kildare and 25 Sts., 2 story, 90x165 ft., steel, brick, Lannon stone church, to Frank Burke & Son, 35 S. Dearborn St., Zone 3. **$300,000.** Bids 2/1, awarded 3/1. CD 1/19.

Ill., Chicago—APARTMENT—Trust Co. of Chicago, 77 W. Washington St., Zone 2, 4 story, 63x163 ft. concrete, brick apartment, 6900 S. Shore Dr., to Carl Erickson & Co., 4657 N. Ravenswood, Zone 40, **$450,000.** Awarded 2/27. CD 4/18.

N. J., Bordentown—RESIDENTIAL DEVELOPMENT—Robert G. Taggart, 312 Prince St., residential development, separate contracts. **$250,000.** Dante J. D'Anastasio, 1815 Federal St., Camden, archt.

N. J., North Plainfield—HOUSES—Ray H. LaCee & Joseph Weiss, c/o Frederick W. Harsen, Summit St. and E. Railroad Ave., Tenafly, 33 one family houses, Oak Ridge Ave. Owner builds, **$250,000.**

N. Y., Garden City—SCHOOL—St. Ann's Church, Rev. Fugenet McCloskey, paster, 70 Adams St., school, Dartmouth St. and New Hyde Park Rd. to Onorato Constr. Co., 1066 St. Marks Ave., Brooklyn. Approx. **$300,000.** Beatty & Berlenbach, 32 Court St., Brooklyn, Zone 2, archts.

N. Y., Garden City—HOUSES—Heathcote Homes, L. J. Mulhauser, pres., c/o Karl Bloch, archt., 7 Landsdown Ave., Merrick, 20 one family houses, Meadow St. and Franklin Court. Owner builds. Approx. **$250,000.**

N. Y., New Rochelle—CHURCH—Shiloh Baptist Church, 185 Lincoln Ave., church bldg., to L. M. Neckermann & Son, 205 E. 42 St., New York. Approx. **$325,000.** C. Hobart Sherwood, 7 Mitchell Ave., Yonkers, archt.

N. C., Durham—APARTMENT—Mutual Heights Apartments, c/o contractor, 148 apartment units, to William Muirhead Constr. Co., Durham. Approx. **$775,000.**

Pa., Phila.—RESIDENCES—Germantown Home Builders Co., c/o Henry S. Berg, archt., 1411 Walnut St., residential development, Stanwood St., separate contracts. **$250,000.**

Pa., Phila.—RESIDENCES—Hyman Korman, 6033 Castor Ave., residential development, Knorr and Glenview Sts. etc., separate contracts. **$314,000.**

Pa., Phila.—RESIDENCES—Elwood H. Leitenberger, 1909 Cottman St., residential development, Cottman St., separate contracts. **$250,000.**

Pa., Phila.—RESIDENCES—Harry M. Shender, 850 Longshore St., residential development, Souder St., separate contracts. Approx. **$250,000.** G. Harold Murphy, 1621 Sellers St., archt.

Pa., Wilkinsburg—APARTMENT—Wm. Penn Heights, Inc., P.O. Box 472, Latrobe, 3 story, bsmnt., brick apartment, Wm. Penn Hy., to Dill Constr. Co., Latrobe. **$560,000.** Clarence Blazard, 901 Ridge Ave., Pittsburgh, archt.

Pa., Wyncote—RESIDENCES—20th Century Constr. Co., 27 and Marlton Pike, Camden, N. J., residential development, Washington Lane and Church Rd., separate contracts. **$250,000.**

R. I., Cranston — APARTMENTS — Biltmore Constr. Corp., 35 Cavalcade Blvd., Providence, thirty 3 story bsmnt., brick, steel apartments, Norwood Ave. Owner builds. Approx. **$250,000.**

S. C., Columbia—CHURCH—Park Street Baptist Church, 1010 Bryan St., church, to Mechanics Contr. Co., 1325 Main St., **$276,536.** Bids 2/23. CD 2/7.

Tenn., Chattanooga—APARTMENT—Real Estate Management, Inc., c/o contractor, 60 unit apartment, to Lindsey-Davis Co., 401 N. Market St. Approx. **$300,000.**

Tenn., Memphis — APARTMENT — Greer & Kimbrough, Inc., c/o W. C. Lester, archt., Dermon Bldg., 27 apartments. Owner builds. Approx. **$750,000.**

Tex., Abilene — OFFICE — Wooten Properties, Inc., Abilene, office, own forces. Approx. **$475,000.** CD 12/29.

Tex., Dallas—HOUSING—Lilac Corp., 3918 Gaston St., 2nd housing. Owner builds. Approx. **$250,000.**

Tex., Dallas—HOUSING—Rupley-Lively Constr. Co., 3607 Greenville Rd., housing. Owner builds. Approx. **$250,000.** CD 2/27.

Tex., Fort Worth—RESIDENCES—Frank C. Bliss, 407 W. 7 St., 74 residences. Owner builds. Approx. **$350,000.** CD 2/27.

Tex., Fort Worth—APARTMENT—E. E. Clair, Inc., 2825 Crockett St., Houston, addnl. apartment, own forces. Approx. **$425,000.** CD 2/27.

Tex., Houston—DWELLINGS, etc.—Master Craftsman, Inc., 2436 Bissonet St., 32 dwellings, north of Richmond Rd. Approx. **$480,000;** shopping center, Wesleyan Rd. **$375,000.** Owner builds. CD 2/15.

Tex., Pasadena—DWELLINGS—C. O. Beeler Lumber Co., Inc., 2300 Pease St., Houston, addnl. 75 dwellings, Red Bluff Rd. and Sterling St. Owner builds. Approx. **$450,000.** CD 2/15.

Tex., Port Lavaca—DWELLINGS—Aluminum Co. of America, Port Lavaca, 34 addnl. dwellings, to Atlantic Building Corp., 1200 Givens St., Houston. Approx. **$300,000.** CD 3/3.

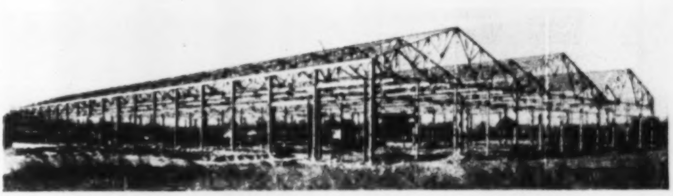
Va., Alexandria — REFECTORY — Virginia Theological Seminary, Alexandria, 1 story, approx. 11,000 sq. ft. refectory bldg. housing 2 dining halls, lounge, kitchen

(Continued on page 324)

When TIME *is of the Essence*

Build with STEEL as did the Ceco Steel Products Company —new plant in Birmingham

View November 4, columns being set in place



View November 17, framing complete, 500 tons

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O'NEAL STEEL WORKS

KIRKMAN O'NEAL, *President*

***Offices:* 745 North 41st Street**
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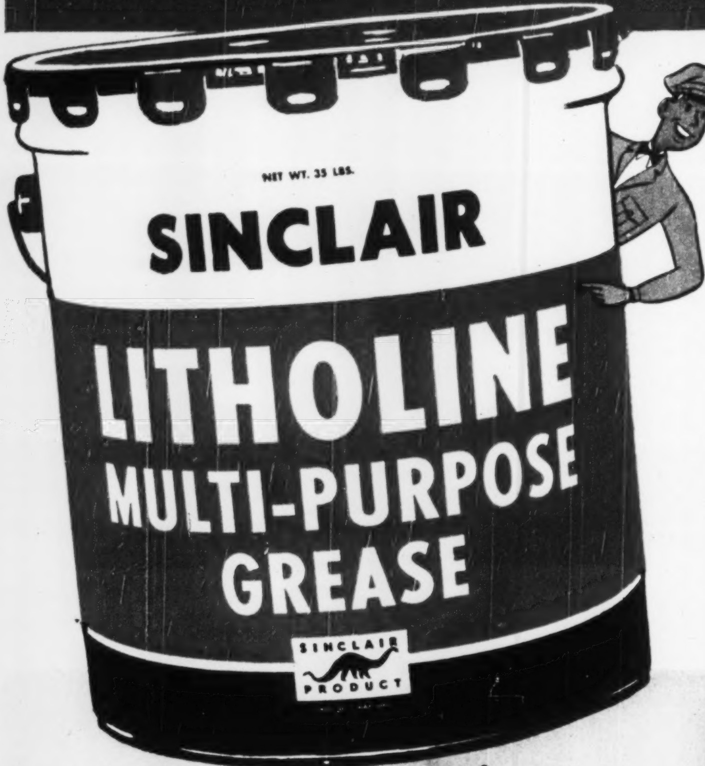
ONE Grease for ALL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PRODUCT

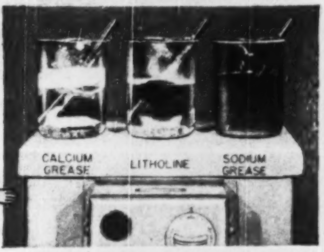
"Yes—One Grease, One Gun and A Better Job too!"

Here is a versatile grease that can be used with absolute confidence *wherever* lubrication is needed—chassis, wheel bearings, water pumps, universal joints, etc., in winter or summer—under *all* kinds of operating conditions.

These 4 Severe tests prove SINCLAIR LITHOLINE is better than any single grease!

SCENE: Sinclair's Research Laboratories, Harvey, Ill.

CAST: Two commonly-used greases of highest quality; a calcium soap chassis lubricant and a sodium soap wheel bearing grease; and Sinclair's Litholine.


CALCIUM GREASE
LITHOLINE
SODIUM GREASE

WATER RESISTANCE TEST!

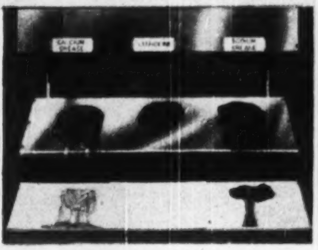
Samples of each grease are heated in beakers of water. Near boiling, the sodium grease disintegrates into soapy water and oil. Shortly after boiling the calcium grease shows foamy emulsion as grease absorbs excess water. Litholine remains unaffected, proves its superiority in combating wet conditions.

SINCLAIR REFINING

Lubrication Jobs!

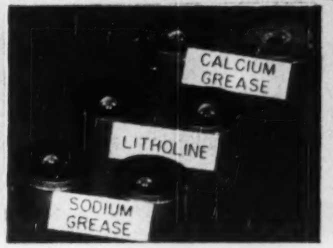
LOOK WHAT ONE-GREASE—ONE-GUN LUBRICATION MEANS TO YOU...

1. Superior protective lubrication
2. No danger of misapplication
3. Less chance for contamination
4. Reduced time-out for lubrication and maintenance
5. Fewer servicing man-hours
6. Less wastage
7. Fewer dispensing units
8. Smaller grease inventories
9. Simplified purchasing and distribution
10. A finer grease at every lubrication point



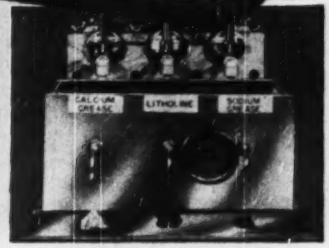
HEAT-RESISTANCE TEST!

The samples are heated on a plate. At 190°F., the calcium grease disintegrates. At 340-350°F., the sodium soap structure collapses and releases the oil. Bearing failures would follow. At 380°F., Litholine shows no effects, proves superior for high temperature lubrication jobs.



MECHANICAL STABILITY TEST!

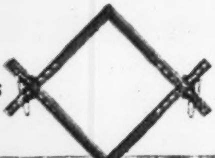
Worked (kneaded) samples are placed beside samples of unworked grease. Steel balls are dropped. Distance ball sinks in worked samples shows increase in softness—loss of stability. The calcium grease showed greatest increase in penetration, the sodium grease next. Litholine showed no difference whatever . . . proving its superior mechanical stability in service.

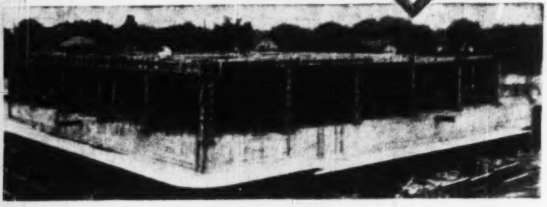


LOW TEMPERATURE PUMPABILITY TEST! Lever-type grease guns are filled with chassis greases and cooled. At 20°F., it is impossible to pump the sodium grease. At 0°F., it is impossible to pump the calcium grease. But Litholine still pumps in good volume! Yet Litholine is a heavier (harder) grease. Thus, Litholine has the body for summer service yet is pumpable in severely low temperatures.

COMPANY

For lubrication counsel, or more information on Litholine, see your nearest Supplier of Sinclair Products, or write to Sinclair Refining Company, 630 Fifth Avenue, New York 20, New York.





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● On countless buildings throughout the nation . . . large or small . . . Rooshors have effected great savings in time and material over outmoded 4 x 4 shoring. Rooshors are readily handled by one man—transporting, setting, releasing and moving to a new location. They are instantly adjustable within their three ranges of sizes: 8 ft. to 14 ft., 7 ft. to 13 ft., and 5 ft. to 9 ft.—higher stories are shored with Roos Extension Shores.

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GENERAL OFFICES—ALLENTOWN, PENNA., U.S.A.
MANUFACTURERS OF THE "CEMENT GUN"

(Continued from page 321)

and laundry, covered passages will link refectory with 4 dormitories, to Davis, Wick & Rosengarten Co., Inc., Metropolitan Natl. Bank Bldg., Wash., D. C., Approx. **$250,000.** Faulkner, Kingsbury & Stenhouse, Ring Bldg., Wash. D. C., archts. Guy B. Panero, 1406 G St. N. W., Wash. D. C., mechanical engr.

▲ **Wash., Seattle**—HOUSES—E. Moss, 272 E. 55 St., 65 one and two story, brick houses, day labor, **$1,000,000.**

Wash., Spokane—STORE—J. J. Newberry Co., 245 Fifth Ave., New York, N. Y., 2 story, 60x104 ft., steel, concrete store first unit of $1,500,000 project, to W. G. Meyers Hyde Bldg., Spokane, **$385,783.** Bids 1/30. CD 1/23.

W. Va., Buckhannon—DORMITORY—West Virginia Wesleyan College, Buckhannon, men's dormitory, to A. Farnell Blair Co., 1306 Spring St. N.W., Atlanta, Ga. **$300,000.** Bids 2/21. CD 12/21.

W. Va., Fairmont—STORE—G. C. Murphy Co., McKeesport, Pa., 1 story, bsmnt., sub-bsmnt., 60x137 ft., brick store alterations, addns., to Lynch, Pugh & Corson, P.O. Box 664, Morgantown. Approx. **$250,000.**

Wis., Milwaukee—RESIDENCES—Home Designers & Builders, Inc., 8329 W. Burleigh St., Zone 10, thirty-nine 1 story, 24x33 ft., frame residences, block fdn. Owner builds. **$253,400.**

B. C., Victoria—APARTMENT—R. J. Efford, 2119 Kingsway, Vancouver, 2 story, frame, stucco 27 suite apartment, to Whitsell Constr. Co., Ltd., 2119 Kingsway, Vancouver. **$250,000.** J. H. Harvey, 49 W. Hastings St., Vancouver, archt.

Que., Three Rivers—CHURCH—Roman Catholic Parish of Ste. Marquerite de Cortonne, 7 Chamberland St., 60x200 ft., concrete, stone church to Page Equipment & Constr. Co., Ltd., 1497 Craig St. Approx. **$300,000.** Bids 1/27. CD 1/18.

INDUSTRIAL BUILDINGS

BIDS ASKED

Kan., Axtell—GARAGE, etc.—B.A. About 4/1—Nemaha-Marshall Rural Electric Assn., Axtell, garage and office $70,000, Clayton & Murray, Abilene National Bank Bldg., Abilene, archts. CD 2/27.

Conn., Willimantic—SHOWROOM and GARAGE—Bids Asked—Leonard Motor Co., Inc., 27 Meadow St., 1 story, brick masonry, cinder block 40x40 ft. showroom and 40x170 ft. garage, Valley St. $68,000. A. R. Sharpe, R.F.D. No. 1, archt.

Ill., Chicago—Bids Asked—Kinkead Industries Inc., 5900 N. Pulaski St., 1 story 20,000 sq. ft. factory, $125,000. Herbert Banse, 53 W. Jackson St., Zone 4, archts.

N. J., Mount Holly—SALES and GARAGE—Bids Asked—Weigel Chevrolet, 25 Marne Highway, auto sales and garage, Approx. $68,000.

Wis., Milwaukee—WAREHOUSE—Bids Asked—Afraum Bros., 315 N. 8 St., Zone 3, 1 story, part bsmnt., 115x155 ft., cement block, steel warehouse, block fdn., concrete floor. H. M. Schmidt, 7004 W. Garfield Ave., Wauwatosa, Zone 13, engr.

Que., Princeville—ABATTOIR—Bids Asked—Princeville Co-operative Req'd Princeville enlarging 2 story, 80x200 ft., concrete steel abattoir. $200,000.

SOON LETS CONTRACT

Calif., Richmond—WAREHOUSE—Felice & Perrelli Canning Co., 10 and Hall Sts., soon lets contract 148x227 ft. warehouse addn., concrete slab on piles. Approx. $68,000. Donald Beach Kirby & Thomas B. Mulvin, 461 Market St., San Francisco, archts.

Ga., Macon—GARAGE—Bibb Transit Co., 399 Cotton Ave., soon lets contract bus garage. Approx. $75,000. Plans deposit $25. MacEwen, Hall & Ferguson, Bankers Insurance Bldg., archts. CD 2/20.

Neb., Bellevue—POWER PLANT FLUES, etc.—Loup River Public Power Dist., Columbus, soon lets contract power plant flues and ducts furnished and installed. Sargent & Lundy, 140 S. Dearborn St., Chicago, Ill., engrs. CD 9/1, under Unclassified.

Pa., Phila.—FACTORY—Scott Building Corp., c/o Louis Magaziner, archt., 1701 Walnut St., soon lets contract 5 story bsmnt., factory, Scott Bldg. addn., 2116 Arch St. Approx. $250,000.

Pa., Phila.—PLANT—Stone Container Corp., Eastern Div., Tulip and Decatur Sts., soon lets contract mfg. plant addn. Approx. $68,000. Conheim & Weger, 1728 Spruce St., archts.

Tenn., Memphis—PLANT—Plough, Inc., c/o Wigton-Abbott Corp., archts., 1225 South Ave., Plainfield, N. J., soon lets contract mfg. plant alterations, addns. CD 9/16.

Wis., Manitowoc—PLANT—Manitowoc Public Utility, 817 Franklin St., soon lets contract power plant addn. Plans deposit $10.

LOW BIDDERS

Ia., Cresco—PLANT—Farmers Co-operative Creamery Assn., Cresco, Feb. 21, general contract creamery plant, from R. A. Stolz Co., New Hampton, $74,800, Charles Altfillisch, Decorah, archt.

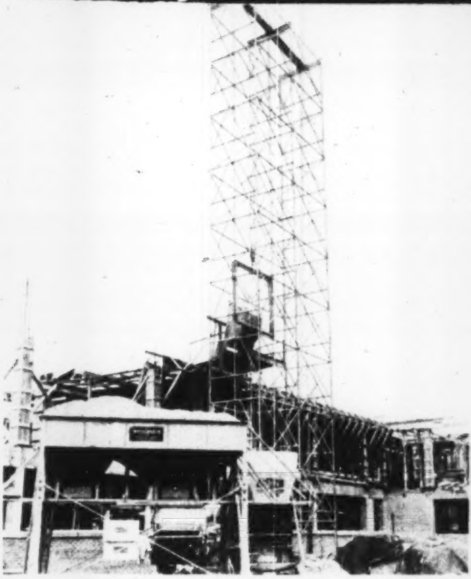
Minn., Maple Lake—GARAGE, etc.—Wright-Hennepin Electric Co-operative, Maple Lake, rejected bids Jan. 19, R.E.A. garage-office. L. B. $159,615. CD 2/1, under LB.

N. D., Grand Forks—PLANT—Minnkota Power Co-operative, Grand Forks, Feb. 23, superstructure for plant

(Continued on page 324b)

Assembly Time Reduced 50%, Greater Job Safety with

Safway Steel Material Handling Towers



Save up to 50% on erection and dismantling time . . . gain in convenience and safety . . . with the all-steel Safway "Intermediate" Material Tower. 4,000 lbs. capacity — 200 ft. maximum height. Double and single well types. Available with 3-wheelbarrow cage platforms, concrete buggy and hopper, and 1,000 lb. capacity, 15 ft. boom (full 180° swing).

Use Safway equipment to handle all kinds of construction work *better, faster* and *safer*. Other products include tubular steel shoring and scaffolding, suspended scaffolds, rolling towers, mason scaffolds, sidewalk canopies, etc. Interchangeable, re-usable parts are easily assembled and dismantled without special tools. Approved by Underwriters' Laboratories, Inc.

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Today the DUMPCRETE is hauling concrete in 43 states!

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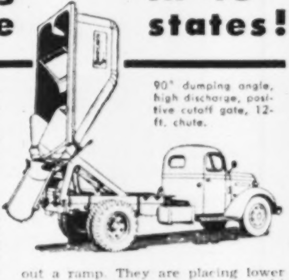
They are hauling concrete over 45 minutes without agitation and without segregation. They are dumping into buckets, hoppers and forms without a ramp. They are placing lower slump, easy-to-work concrete right where it's wanted with a 12 ft. chute.



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18 East 48th Street, New York 17, N. Y.
New Orleans Cincinnati Boston

(Continued from page 324)

from Fuel Economy Eng. Co., 510 New York Bldg., St. Paul, Minn. $147,785. CD 2/16.

Tex., Houston—WAREHOUSE—Mathieson Chemical Corp., 2nd Natl. Bank Bldg., rejected bids 62x107 ft. steel frame warehouse, concrete slab fdn. $85,000. CD 2/23.

Tex., Waxahachie—PLANT—Coco Cola Bottling Wks., 1001 Second Ave., Dallas, Mar. 1, bottling plant alterations, remodeling, addns., from Miller & Norton, 4415½ Belmont Ave., Dallas. $68,330. Est. $75,000. CD 2/24.

CONTRACTS AWARDED

Calif., Burbank—FACTORY—General Controls Co., 801 Allen Ave., Glendale, 168x300 ft., masonry factory addn., to C. B. Bennett, 321 W. Doran St., Glendale, $105,000. L. L. Penn, 2422 Galbreth Rd., Pasadena, engr.

Calif., Emeryville—WAREHOUSE, etc.—Maxwell Reed, Ocean Ave. and Hollis St., warehouse and office, to John J. Moore Co., 959 33 St., Oakland. Approx. $75,000.

Conn., Danbury—FACTORY—Danbury Eng. Wks., Main St., 1 story, brick, steel, concrete factory, to Turner Constr. Co., 420 Lexington Ave., New York, N. Y., Approx. $100,000. Abbott Merkt & Co., 10 E. 40 St., New York, N. Y., archts.

Conn., North Haven—FACTORY—Tollen Co., Inc., State and Devine Sts., 1 story brick factory, State St. Owner builds. $72,000.

Conn., Willimantic—STORAGE UNIT—American Screw Co., W. Main St., 1 story 50x300 ft., brick, concrete storage unit, W. Main St., to Jones Constr. Co., Route 6, Columbia. Approx. $68,000.

Ga., Carrollton—PLANT—Stylewise Mills, Inc., c/o contractor, mfg. plant, to Roy Richards Constr. Co., Carrollton. Approx. $75,000.

Idaho, Boise—WAREHOUSE—Dependable Wholesale Grocery Co., Inc., 418 S. 9 St., 1 story, bsmnt., 70,000 sq. ft., rein.-con. warehouse, to C. W. Watkins & Son, 1703 N. 13 St., Boise $208,769, CD 2/24.

Ill., Chicago—PLANT—Eversharp Inc., 1800 W. Roscoe St., Zone 15, plant alterations, to H. F. Smith, 152 W. Ogden St., Zone 8, $70,000. Rapp & Rapp, 230 N. Michigan St., Zone 1, archts.

Ill., Chicago—MEAT PACKING HOUSE COOLER—Illinois Packing Co., 911 W. 37 St., Zone 9, 3 story, bsmnt., rein.-con., brick cooler bldg. plant addn., to Enger Bros., 4910 W. St. Paul Ave., Zone 39, $350,000. Bids 1/30, awarded 3/2. CD 1/25.

Kan., Selden—GRAIN ELEVATOR—Hart Grain Co., Selden, grain elevator, to Johnson & Sampson Contr. Co., Salina. $150,000.

Kan., Topeka—GRAIN ELEVATOR—Builders, Inc., 352 N. Broadway, Wichita, grain elevator, Gordon and Vail Sts. Owner builds, $200,000.

Kan., Wichita—WAREHOUSE—Wm. Volker & Co., 701 E. 1 St., warehouse, to National Insst. Constr. Co., Palo Alto, Calif. $150,000. F. A. Constable, Palo Alto, Calif., archt.

Kan., Wichita—STOCK YARDS—Wichita Union Stock Yards Co., Livestock Exchange Bldg., Wichita, stock yards constr., alterations, to Mainelli Constr. Co., 4502 S. 36 St., Omaha, Neb., $300,000.

Ky., Clarkson—BOOSTER STATION—Standard Oil Co. of Ohio, Sun Oil Co., Midland Bldg., Cleveland, O., booster station, to O. L. Olsen Co., Esperson Bldg., Houston, Tex., $200,000. Awarded 2/20. O. E. Morril, V. P. Comt., 407 N. 8 St., St. Louis, Mo., engr.

Miss., Tupelo—BAKERY—Hardin's Bakeries, c/o Morris L. McNair, archt., Rosenbaum Bldg., Meridian, 25,000 sq. ft. bakery, to Phil Hardin, 3942 North Wood St., Meridian. Approx. $200,000. CD 12/8.

Mo., St. Louis—FACTORY—Evens & Howard Sewer Pipe Co., 5200 Manchester Ave., Zone 10, 1 story, 101½x101½ ft. sewer pipe factory, 5200 Manchester Ave., to G. L. Tarlton Contg. Co., 5505 Dale Ave., Zone 10, Standley & Co., Inc., 5100 Wise Ave., Zone 10, engr.

Mo., St. Louis—FACTORY—Missouri Boiler & Sheet Iron Wks., 23 and Papin St., Zone 3, 1 story, 150x135 ft., transite, brick, steel, concrete factory, 33 ft. high, 2 story, 25½x70 ft. brick office bldg., 2238 Papin St., to W. C. Harting Constr. Co., 722 Chestnut St., Zone 1, $100,000. Fred R. Nauman, 714 N. Woodlawn St., Kirkwood, (St. Louis 22, P. O.), archt. Leslie J. Bergmeier, 1504 S. Grand Blvd., Zone 4, engr.

N. Y., Astoria—SUBSTATION—Consolidated Edison Co., 4 Irving Pl., New York, Zone 3, superstructure, North Queens Substation, to Rheinstein Constr. Co., 21 E. 40 St., New York, Zone 17. Bids 2/8. CD 1/31.

N. Y., Long Island City—PLANT—Stein-Davis Co., 12-10 Jackson Ave., Long Island City, 5 story, 90x100 ft. plant addn. with laboratory facilities on fifth floor, to Turner Constr. Co., 420 Lexington Ave., New York, Zone 17. Alexander D. Crosett, 27 William St., New York, engr.

N. C., Laurel Hill—PLANT—Morgan Cotton Mills, Laurel Hill, Springfield plant addn., to McKoy-Helgerson Co., Greenwood, S. C. $172,780. Bids 2/23. CD 2/14.

O., Portsmouth—SLAB FURNACE—Detroit Steel Co., 1025 S. Oakwood St., Detroit, Mich., slab furnace, to Rust Eng. Co., Clark Bldg., Pittsburgh, Pa. Approx. $300,000. Awarded 2/23.

O., Wilmington—FACTORY—Randall Co., Wilmington, factory, to [illegible] Co., 5302 Vine St., [illegible]

Pa., Barnesville—PIPE LINE TERMINAL—Gulf Oil Corp., 1515 Locust St., Phila., pipe line terminal, to Vanguard Constr. Corp., 369 Lexington Ave., New York, N. Y. $100,000. Rudolph L. Wolff, c/o owner, engr.

Pa., Clarion—STORAGE—R. & H. Corp., 1708 Staunton Ave., New Kensington, 1 story, 60x135 ft. concrete block, steel truss transport storage bldg., to John Trunk, 214 7 Ave., Clarion.

Pa., Grove City—PLANT—Cooper Bessemer Corp., Grove City, 3 story, 52x178 ft., brick, steel mfg. plant addn., to Montgomery Constr. Co., 803 W. Main St. Approx. $75,000.

Pa., Milesburg—PLANT—West Penn Power Co., Milesburg, design and construction brick, steel frame plant addn., concrete floor and roof constr. to Sanderson & Porter, 52 William St., New York, N. Y. Approx. $250,000.

Pa., Phila.—PLANT, etc.—George K. Garrett Co., Inc., 1421 Chestnut St., plant addn. and office alterations, separate contracts. $75,000. Max Haupt, 138 S. 9 St., engr.

S. C., Gaffney—MILL—Deering Milliken Mills, Gaffney, mill addn., to Daniel Constr. Co., Greenville, $172,500. Bids 2/17.

S. C., Greenville—SHOP, etc.—Abbott Machine Co., c/o contractor, shop and office, to Potter & Shackelford Constr. Co., Greenville, $79,100. CD 1/19.

Tex., Amelia—RICE DRIER, etc.—Elizabeth Rice Drying Co., Beaumont, rice drier and warehouse, to Don Smith, 3134 Grafton St., Houston. Approx. $70,000.

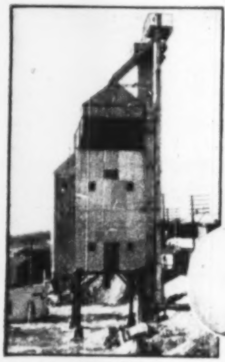
N. S., Halifax—PRESS—Herald Publishing Co., Argyle St., 2 story, 69x85 ft., concrete, steel press bldg., to Brookfield Constr. Co., Ltd., 32 Inglis St. Approx. $150,000.

Ont., Chatham—SILOS—Canada & Dominion Sugar Co., Ltd., Chatham, 4 concrete silos, 40 ft. inside diam., conveying tower rising 135 ft., etc., to MacDonald Eng. Co. of Canada Ltd., C. P. R. Bldg., Toronto. Approx. $400,000. Dominion Constr. Co., Ltd., 150 W. First Ave., Vancouver, B. C., archt. CD 5/6/48.

Ont., Hamilton—PLANT—Wallace Barnes Co., Ltd., 274 Sherman Ave., 1 story, bsmnt., 60x100 ft., rein.-con., structural steel, brick plant adin., to W. H. Cooper Constr. Co., Ltd., 7 Hunter St. Approx. $75,000.

Ont., London—PLANT—Hobbs Glass Co., J. E. Jones, genl. mgr., 57 York St., 1 story, bsmnt., 77x150 ft., brick, steel plant addn., to McKay Cocker Constr. Co., 230 Dundas St., London, $300,000. CD 3/2.

Ont., Windsor—FOOD PREPARATION—Ford Motor Co. of Canada Ltd., 2780 Sandwich St., E., 1 story, 95x120 ft., brick concrete food preparation bldg., to Hein Constr. Co., Ltd., 172 Aylmer Ave. Approx. $85,000. Bids 2/27. CD 3/1.



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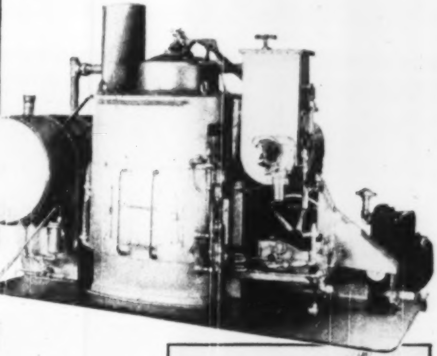

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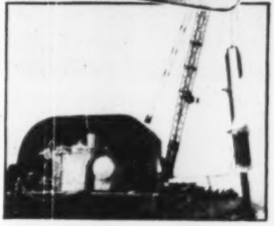

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Que., Arvida—PLANT—Aluminum Co. of Canada Ltd., Sun Life Bldg., Montreal, plant addn., to Foundation Co. of Canada Ltd., 1900 W. Sherbrooke St., Montreal, **$160,000.**

Que., Montaubau—PLANT—Anacon Lead Mines Ltd., modernization and imprv mining plant, day labor. **$200,000.** Douglas Parent, ch. engr.

UNCLASSIFIED

BIDS ASKED

† **Vt., North Shrewsbury**—RIFLE RANGES—B. A. 3/30—U. S. Eng., Bldg. 21 Naval Drydock, South Boston, Mass., rifle ranges, 18 concrete and earth filled target butts, fire lines, 100-200-300 yard points, storage bldg., etc., Coolidge State Forest, 43-007-UG-50-2. CD 3/3.

† **Washington**—SWITCHYARD—B.A. 3/30—Bureau Reclamation, Dpt. Interior, Coulee Dam, right switchyard exten. for Grand Coulee Power Plant at Grand Coulee Dam, Columbia Basin Proj., Spec. 2933. L. N. McClellan, Bldg. 1-A, Denver Federal Center, Denver, Colo., ch. engr.

Ont., Meaford—SKATING RINK—B.A. 4/1—Stuart Kingston, Meaford, 75x175 ft., skating rink. CD 1/3.

LOW BIDDERS

O., Columbus—CONDENSER, etc.—State Dpt. P. Wks., Columbus, install condenser and circulating water lines on new power turbine at Ohio State University, from Christopher Constr. Co., 40 W. Gay St. **$72,210.**

B. C., Victoria—WHARF—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., Feb. 15, wharf reconstr. near Johnston St. Bridge, from Pacific Pile Driving Co., Ltd., 805 View St., Victoria. Approx. **$136,995.** CD 1/25.

CONTRACTS AWARDED

† **Colorado**—CIRCUIT BREAKERS, etc.—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Schedules 1 and 2, four 115,000 volt circuit breakers and seven 115,000 volt disconnecting switches with spare parts for Leyner substation, near Longmont, Boulder Co., Colorado-Big Thompson Proj., Spec. 873, to General Electric Co., 650 17 St., Denver, **$98,924.** Awarded 2/27.

Colorado—RURAL DISTRIBUTION LINES—Holy Cross Electric Assoc., Glenwood Springs, 111.8 mi. rural distr. line, Eagle Co., to R. N. Campsey, 2520 Leyden St., Denver, labor **$59,864**, material **$111,000**, total $170,864. CD 11/24/47.

Colorado—RURAL DISTRIBUTION LINES—San Isabel Electric Assoc., Pueblo, 24.13 mi. 68kv transmission line, Pueblo Co., to Lindsey Constr. Co., 115-176 Avenue North, Nashville, Tenn. **$70,139.** Bids 12/8. CD 11/25.

Fla., Jacksonville—SWIMMING POOL—City, City Hall, main swimming pool for colored people, 4 and Jefferson Sts., to E. C. Kenyon, 4276 Verona Ave., Zone 1, **$72,453.** Bids 2/23. CD 2/10.

Ga., Atlanta—PIPE LINES—The Texas Co., c/o contractor, steel pipe lines for fuel storage tanks, to Latex Constr. Co., 4911 Old Peachtree Rd. **$55,420.**

Ia., Des Moines—TELEVISION RELAY TOWER—Northwestern Bell Telephone Co., 19 and Douglas Sts., Omaha, Neb., television relay tower. Owner builds, **$127,489.** Wetherell & Harrison, Shop Bldg., Des Moines, archts. Rose & Rose, 254 W. 54 St., New York, N. Y., structural engrs.

Kansas—RURAL DISTRIBUTION LINES—Central Kansas Electric Co-operative Assoc., Inc., Great Bend, 60.97 mi. 44 KV transmission line, Barton Co., to M. & M. Constr. Co., P. O. Box 2807, Kansas City, Mo., labor **$18,969**, material **$61,000**, total $79,969. Flora Eng. Co., 1717 E. Colfax St., Denver, Colo., engr. CD 10/27.

Kansas—RURAL DISTRIBUTION LINES—Flint Hills Rural Electric Co-operative Assoc., Inc., Council Grove, 236.28 mi. rural distr. lines, Morris Co., to Pendleton Constr. Co., 326 Leonhardt Bldg., Oklahoma City, Okla., **$322,152.** Bids 12/13. Frank Horton & Co., Lamar, Mo., engrs. CD 12/7.

Kansas—RURAL DISTRIBUTION LINES—Great Plains Electric Co-operative, Inc., Colby, 332.64 mi. rural distr. lines, Thomas Co., to Kennett & Pavlicek, Box 1305, San Angelo, Tex. **$289,121.** John C. Leavitt Co., Garden City, engr.

Kansas—RURAL DISTRIBUTION LINES—Kaw Valley Electric Co-operative Co., Inc., 1513 Lane St., Topeka, 165.73 mi. rural distr. lines, Shawnee Co., to Arthur Tucker Electric Co., 619 Jackson St., Topeka, **$213,128.** Bids 10/19. Frank Horton & Co., Lamar, Mo., engrs. CD 10/18/48.

Louisiana—RURAL DISTRIBUTION LINES—Beauregard Electric Co-operative, Inc., De Ridder, 250 mi. rural distr. lines, Beauregard Parish, to R. D. Cooper Constr. Co., P. O. Box 1763, Baton Rouge, **$267,569.** CD 8/19.

Michigan—RURAL DISTRIBUTSION LINES—O. & A. Electric Co-operative, Newaygo, 156 mi. rural distr. lines, Allegan Co., to Transformer Inspector Co., 324 Washington Sq. Bldg., Royal Oak, Mich., **$232,471.** J. & G. Daverman Co., 301 Keeler Bldg., Grand Rapids, engr. CD 5/3/48.

Michigan—RURAL DISTRIBUTION LINES—Presque Isle Co-operative, Onaway, 27.5 mi. 3 phase transmission line, Presque Isle Co., to Clifton Eng. Co., Inc., Three Rivers, **$81,666.** J. & G. Daverman Co., 301 Keeler Bldg., Grand Rapids, engr. CD 9/23/48.

Missouri—RURAL DISTRIBUTION LINES—Black River Electric Co-operative, Inc., Ironton, 213.7 mi. rural distr. lines, Reynolds Co., to Thaxton Eng. & Constr. Co., Lebanon, **$289,580.** CD 3/6.

Missouri—RURAL DISTRIBUTION LINES—Laclede Electric Co-operative, Lebanon, 348.3 mi. rural distr. lines, 67 mi. conversion lines, Laclede Co., to Griffin Constr. Co., 300 Walnut St., Owensboro, Ky., **$487,974.** Bids 1/4. Frank Horton & Co., Lamar, engrs. CD 12/14.

Missouri—RURAL DISTRIBUTION LINES—Osage Valley Electric Co-operative, Butler, 35.12 mi. rural distr. lines, 24.5 mi. conversion lines, Bates Co., to Triple-H Constr. Co., P. O. Box 50, Linton, Ind., **$134,825.** CD 6/16.

Missouri — RURAL DISTRIBUTION LINES — Scott-New Madrid-Mississippi Electric Co-operative, Inc., Co-operative Office, Sykeston, 66.2 mi. rural distr. lines, 51.9 mi. conversion lines, Mississippi Co., to Irby Constr. Co., 815 S. State St., Jackson, Miss., **$188,971.** Bids 12/19. Rural Line Engineers, 440 S. Brentwood Blvd., Clayton, engrs. CD 12/12.

Missouri—RURAL DISTRIBUTION LINES—Three Rivers Electric Co-operative, Inc., Linn, 13.2 mi. rural distr. lines, 10 mi. 33 kv transmission line, 1.5 mi. conversion line, Osage Co., to Reinhart & Donovan Co., 804 Commerce Exchange Bldg., Oklahoma City, Okla., **$67,687.** Bids 12/16. Frank Horton & Co., Lamar, engrs. CD 12/7.

Mo., Aurora — DRIVE-IN THEATRE—Clifford Hough, Lebanon, drive-in theatre, near here, separate contracts, Approx. **$60,000.**

Mo., Dexter — DRIVE-IN THEATRE — Yewell Lawrence, Bloomfield, 400 car drive-in theatre, on U. S. Hy. 60 about 2½ mi. west of here, separate contracts, Approx. **$60,000.**

Nebraska—RURAL DISTRIBUTION LINES—Cornhusker Rural Public Power Dist., Columbus, 158.9 mi. rural distr. lines, Nance, Platte and Boone Counties, to B.H.R. & W. Constr. Co., Woodward, Okla. **$149,723.** Bids 2/21. CD 1/25.

N. C., Lincolnton—LIGHTING SYSTEM—City, street electrical lighting sys., to R. H. Bouligny, Inc., 433 W. Morehead St., Charlotte. **$64,280.**

O., Columbus—SWIMMING POOL—Salvation Army Advisory Bd., 138 E. State St., swimming pool at Greenwood Lake Camp, to E. Elford & Son, 555 S. Front St. Awarded 2/28.

Oklahoma—RURAL DISTRIBUTION LINES—Choctaw Electric Co-operative, Inc., Hugo, 179.7 mi. rural distr. lines and converting 37.15 mi. line, Choctaw Co., to R. D. Cooper Constr. Co., P. O. Box 1763, Baton Rouge, La. **$277,112.** CD 6/30.

Oklahoma—RURAL DISTRIBUTION LINES—Kiamichi Electric Co-operative, Inc., Wilburton, 191.6 mi. rural distr. lines and converting 48 mi. line, Latimer Co., to Irby Constr. Co., 817 S. State St., Jackson, Miss. **$213,650.** CD 7/28.

Oklahoma—RURAL DISTRIBUTION LINES—Northwestern Electric Co-operative, Inc., Woodward, Part 1, 276.5 mi. rural distr. line and converting 11 mi. line, Woodward Co., to Hoover Bros. Constr. Co., 1117 E. 47 St., Kansas City, Mo. **$225,672.** CD 4/10/47.

Pa., Villanova—TRANSMISSION LINES, etc.—Villanova College, Villanova, underground transmission lines and tunnels, to Phila. Mechanical Contractors, Inc., 615 S. 24 St., Phila. **$134,000.** George M. D. Lewis, 445 Kressler Court, Scranton, archt.

South Carolina—RURAL DISTRIBUTION LINES—Berkeley Electric Co-operative, Inc., Moncks Corner, 68.32 mi. rural distr. line and converting 22.9 mi. line, Berkeley Co., to E. C. Bridges, Heath Springs, **$87,509.** McCall-Thomas Eng. Co., Inc., 112 Church St., Orangeburg, engr.

Tennessee—RURAL DISTRIBUTION LINES—Plateau Electric Co-operative, Oneida, 215.45 mi. rural distr. lines, Scott Co., to Western Constr. Co., Inc., P. O. Box 1290, Jackson, Miss., **$318,247.** Cottrell & House, 902 Stahlman Bldg., Nashville, engrs. CD 7/5.

Texas—RURAL DISTRIBUTION LINES—Dickens County Electric Co-operative, Inc., Spur, 61.5 mi. rural distr. lines, Dickens Co., to Pendleton Constr. Co., 320 Leonhardt Bldg., Oklahoma City, Okla. **$62,160.** H. N. Roberts & Assoc., 1310 Avenue Q, Lubbock, Tex., engrs. CD 8/12.

Texas—RURAL DISTRIBUTION LINES—Greenbelt Electric Co-operative, Inc., Wellington, 145.22 mi. rural distr. line and converting 95.78 mi. line, Collingsworth Co., to Basanda Constr. Co., 2925 N.W. 39 Terrace, Oklahoma City 12, Okla. **$213,412.** H. N. Roberts & Assoc., 1310 Avenue Q, Lubbock, engrs. CD 8/12/46.

Texas—RURAL DISTRIBUTION LINES—Kimble Electric Co-operative, Inc., Junction, 171.81 mi. rural dist. lines, Kimble Co., to Irby Constr. Co., 817 S. State St., Jackson, Miss., labor **$43,026,** materials **$171,000,** total $214,026. Bids 12/6. CD 11/29.

Texas — RURAL DISTRIBUTION LINES—Rita Blanca Electric Co-operative, Dalhart, Sect. 2, rural distr. lines, Dallam Co., own forces. **$110,000.** CD 9/27/48.

Texas—RURAL DISTRIBUTION LINES—South Texas Electric Co-operative, LaWard, rural distr. lines, Jackson Co. **$60,000;** internal combustion gas plant unit, at LaWard, **$205,000,** own forces.

Tex., Houston — DRIVE-IN THEATER—Lone Star Theatres, Inc., 308 S. Harwood St., Dallas, 750 auto drive-in theater, own forces. Approx. **$260,000.** CD 2/16.

Wyoming—RURAL DISTRIBUTION LINES—Wyrulec Co., Lingle, 83.92 mi. rural distr. line, Goshen Co., to Raymond H. Scott Constr. Co., Wheatland, **$98,960.** Walter Walking, 2640 Kearney St., Denver, Colo., engr.

N. S., Halifax—SKATING RINK—Dalhousie University, Halifax, 120x200 ft. steel, stucco concrete skating rink, artificial ice plant, to Cameron Contractors Ltd., Royal Bank Bldg., New Glasgow. Approx. **$170,000.** L. R. Fairn, 41 Argyle St., archt.

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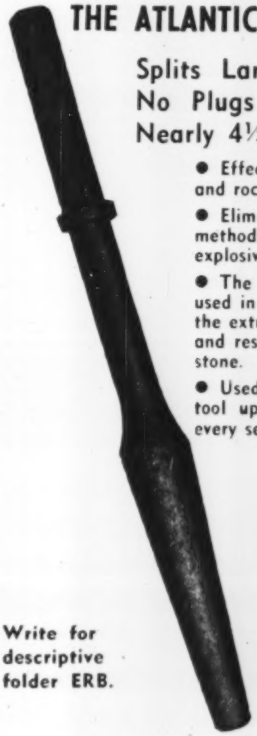

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CONSTRUCTION REPORTS-Second Section

WATER SUPPLY

BIDS ASKED

Wis., New Auburn—B.A. 3/29—Village, water sys. 50,000 gal. elevated steel tank and well. $79,000. Plans deposit $15. Davy Eng. Co., 502 Main St., La Crosse, engr.

Ont., Parkhill—B.A. 3/31—George A. Ronson, Parkhill, water supply treatment plant, for Municipality. W. M. Veitch, P. O. 781, London, engr.

▲ **Ill., Decatur**—B.A. 4/1—City, water sys. imprvs., incl. 14 mi. mains plus fire hydrants. $2,075,000.

Calif., Tracy—B.A. 4/4—State Div. Architecture, P. Wks. Bldg., Sacramento, elevated steel water storage tank and concrete, pile fdns. at Vocational and Agricultural Institution. Anson Boyd, Sacramento, state archt.

LOW BIDDERS

▲ **Calif., San Jose**—Santa Clara Water Conservation Dist., 60 N. 2 St., Mar. 7, 6 mi. Leroy Anderson Dam, 75,000 acre ft. capacity 2½ mi. east of Madrone on Coyote River, Program A, from Guy F. Atkinson Co., 10 W. Orange Ave., South San Francisco, **$1,879,772**; Program B, from United Concrete Pipe Corp. and Westbrook & Pope, Baldwin Park, **$2,175,781**. CD 2/20.

▲ **Md., Baltimore**—City, Bureau Water Supply, 500 Municipal Bldg., Zone 2, Mar. 8, lining Liberty Road water tunnel, incl. trimming tunnel, removal spoils and debris, closure of shafts, removal field offices, furnish, construct complete concrete lining for approx. 36,675 ft. tunnel, from Tunnel Constr. Co., 10 W. 25 St., Zone 18, **$3,151,150**. CD 2/24.

Tex., Galveston—City, Mar. 2, masonry water pump. station, from J. W. Zampter Constr. Co., 2115 Church St. **$146,403**. CD 2/21.

Ont., Ottawa—City, installing WW pipe line in West End to be known as C line to link between Lemieux Island filtration plant and Queen St. Pump. Station, from McDougall Brothers, c/o owner. Approx. **$132,422**. CD 7/21.

CONTRACTS AWARDED

Calif., San Jose—San Jose Water Works, 374 West Santa Clara St., Austrian Dam, 7 mi. south of Los Gatos Creek, 1,000 ft. downstream from Austrian, near here, to Earl Heple, 494 Delmas Ave., **$663,480**. Bids 2/15. CD 2/23, under LB.

▲ **New York, N. Y.**—Bd. Water Supply, 120 Wall St., Zone 5, designs, construction and installation necessary to establish at shaft 6 of Delaware Aqueduct, complete with all equip. and appurtenances and ready for use, an electrically-operated pumping plant capable of pumping 100 million gals. per day, water from the Hudson River into the Delaware Aqueduct against a head of 600 ft. and chlorinating Plant C capable of satisfactory sterilizing the pumped water before it enters the aqueduct, together with suitable buildings for housing the plants, and for operation of said plants for a period not to exceed 4 months subsequent to their completion, near Chelsea, Town of Wappinger, Dutchess Co., to Tuller Constr. Co., 95 Monmouth St., Red Bank, N. J., and A. J. Dillenbeck, P. O. Box 22, Red Bank, N. J., construction **$2,652,000**, construction and operation **$2,684,000**. Bids 2/20. Awarded 3/15. CD 2/21, under LB.

O., Bowling Green—City, City Bd. Control, WW. program Sect. A, low-pressure pumping station and Sect. B, water treatment plant, near Haskins, to Mosier, Constr. Co., Fremont. Approx. **$590,519**. Bids 1/31. CD 2/15, under CA.

SEWERS, WASTE DISPOSAL

BIDS ASKED

Ont., Port Credit—B.A. 3/27—I. Magnesest, Town Hall supply, erecting of air distr. and diffuser sys., supply erecting two electrically driven air compressors. W. J. Anderson, 25 Lakeshore Rd., engr. CD 5/16.

Wash., St. John—B.A. 3/31—Town, Town Hall, treatment plant and 18,010 ft. 8 to 12 in. sewers. $55,000. Plans deposit $30. W. I. Malorey, Symons Bldg., Spokane, engr. CD 11/2/45.

Calif., Atascadero—B. A. 4/4—State Div. Architecture, P. Wks. Bldg., Sacramento, sewage disposal plant of high filter type and water supply, incl. 1 m.g. water storage reservoir, booster pump station, etc. Plans deposit $25. Anson R. Boyd, Sacramento, state archt.

Calif., Los Angeles—B.A. 4/4—Bd. Supervs. Los Angeles Co., 501 Hall of Records, approx. 3.93 mi. 8 in vitr. clay sanitary sewers in Earl St., San Gabriel, C.I.1236. $86,950. C. E. Arnold, co. engr.

Tenn., Chattanooga—B.A. 4/4—City, c/o City Engineer, City Hall, Sanitary Sewer Proj. 5-2-50, Plans deposit $10. CD 11/11.

LOW BIDDERS

Conn., Plainville—Town, Town Hall, 27 Pierce St., sewerage sys., disposal plant, etc. Contr. 7 and Contr. 7A from American Constr. Co., Inc., 100 Airport Rd., Hartford, **$569,288** and **$386,318** respectively; Contr. 7B, from Consolidated Constr. Co., 57 Farmington Ave., Hartford, **$147,994**.

Mass., Brookline—Town, Bd. Selectmen, Town Hall, Mar. 6, sewers and surface water drains Longwood Ave. and Brook St., from Charles Capone Constr. Co., Inc., 44 Wellsmere Rd., Roslindale, **$158,000** wood piles; **$167,842** concrete piles.

Minn., St. Paul—Minneapolis-St. Paul Sanitary Dist., P. O. Box 3598, Childs Rd., Zone 1, Feb. 14, furnish, install 1 multiple-hearth type sewage sludge incinerator, etc., from Morse Boulger Destructor Co., 205 E. 42 St., New York, N. Y. **$149,168**. CD 1/16.

† **Tenn., Oak Ridge**—U. S. Atomic Energy Comn., P. O. Box 3, Mar. 7, sewage treatment plant at Oak Ridge National laboratory, from John A. Johnson & Sons, Inc., W. Division Rd. **$105,356**. CD 2/1.

Tex., Corpus Christi—City, Mar. 7, storm drainage in Louisiana St., Alameda to Staples St., incl. rein. con. box culverts; from Heldenfels Bros., Box 1917, **$128,000**. R. L. Otto, city engr. CD 12/28.

Wash., Centralia—City, City Hall, sewage treatment plant, from A. G. Homann, Lacey, **$272,800**. CD 2/8.

CONTRACTS AWARDED

Calif., Fairfax—Sanitary Dist. 1 of Marin Co., 11 Library Pl., San Anselmo, sanitary sewers, Assessment Dist. 10, to Barrett & Hilp, 918 Harrison St., San Francisco, **$167,478**. Bids 3/8, awarded 3/8. CD 2/20.

Ill., Chicago—Sanitary Dist. of Chicago, 910 S. Michigan St., South Side Intercepting Sewer Contr. 5 and Racine Ave. Pumping Station, Div. K, to Santucci Constr. Co., 5044 Carol St., Skokie, **$567,498**. Bids 3/2, awarded 3/6. CD 3/9 under LB.

▲ **Ill., Chicago**—Sanitary Dist. of Chicago, 910 S. Michigan St., North Shore Intercepting Sewer, Contr. 8, Winnetka and Glencoe, to S. A. Healy Co., 46 and S. Morgan Sts: **$1,473,000**. Bids 1/13, awarded 3/6. CD 1/19, under LB.

Ill., Mascoutah—City, R. Pfeifer, mayor, sewer extens., imprvs. incl. 25,960 lin. ft. sewers, 1,400 ft. pressure line, pump. station, etc., to Frederich Excavating Service, Mascoutah, **$129,442**. Russell & Axon, 408 Olive St., St. Louis 2, Mo., engrs.

Ind., Washington—Bd. P. Wks., R. I. Burris, mayor, sewerage sys., to Thompson Constr. Co., 3840 Prospect St., Indianapolis, **$636,392**; sewerage treatment plant, to Edw. McCarthy & Son, 2305 Clifton Ave., Cincinnati, O., **$382,832**. Bids 2/13, awarded 3/8. CD 2/24, under LB.

▲ **La., New Orleans**—Sewerage & Water Bd. of New Orleans, 526 Carondelet St., Contr. 241-D, 8,400 lin. ft. 20 to 28 in. rein. con. lined and covered canal in Orleans Ave. and N. Jefferson Davis Parkway to Pumping Station 7 and tributary lines in various streets, to Boh Bros. Constr. Co., 2400 Cypress St. **$1,967,579**. Bids 3/1, awarded 3/9. CD 3/7, under LB.

La., Ville Platte—Gravity Sub-Drainage Dist. 1 of The Ville Platte Gravity Drainage Dist. 10, Ville Patte, storm drainage works, to H. L. Allen & Sons, Elton, **$180,252**. Bids 3/7. CD 2/14.

▲ **N. Y., New York**—Dpt. P. Wks., Municipal Bldg., Zone 7, Throgs Neck Intercepting Sewers and Pumping Station, Hunts Point Sewage Treatment Works, Bronx Boro, general contract to Poirier & McLane Corp., 33 W. 42 St., Zone 18, **$2,247,340**; pumping station to Edgecliff Constr. Corp., 34-60, 32 St., Long Island City, **$293,550**. Bids 2/9. CD 1/12.

Tex., Bellaire—Associated Home Builders, Bellaire, storm and sanitary sewers, to Mischer-Harris Constr. Co., 5141 Leeland St., Houston, **$56,666** and Approx. **$53,331** respectively. CD 3/3.

BRIDGES

BIDS ASKED

STATE HIGHWAY LETTINGS

March 28
Maryland
April 4
Oklahoma
Wisconsin

April 5
California
April 19
Louisiana
About May 1
Alabama

▲ **O., Cleveland**—B. A. 4/4—New York Central System, E. A. Dougherty, ch. engr., La Salle Street Station, Chicago, Ill., vertical lift bridge across Cuyahoga River at Columbus Rd. $2,000,000. Extended date. Howard Needles, Tammen & Bergendorff, 921 Walnut St., Kansas City, Mo., engrs. CD 3/2.

SOON LETS CONTRACT

Ga., Savannah—Seaboard Airline R.R. Co., 147 Granby St., Norfolk, Va., soon lets contract reconstruct railroad bridge. Howard Needles, Tammen & Bergdorff, 921 Walnut St., Kansas City, Mo., engrs.

LOW BIDDERS

Ill., Chicago—City Dpt. Purchase Contracts & Supplies, City Hall, Mar. 10, substructure of grade separation on N. Laramie Ave. between W. Bloomingdale and W. Grand Ave., Sec. N. Laramie Ave. 1111-2 C.A., from Thomas McQueen Co., 4313 Circle St., Forest Park, **$319,425**. CD 2/17.

New Jersey—State Hy. Dpt., Trenton, rejected Mar. 9, Grassy Sound Bridge approach paving 0.688 mi. Route S-49, Sect. 5B, Cape May Co. LB **$189,102**. CD 2/17.

CONTRACTS AWARDED

Minnesota—State Hy. Dpt., St. Paul, constr. Bridge 5599 over Great Northern and Minneapolis & St. Louis R.R. tracks in Minneapolis, S. P. 2715-04 TH 12-107), Minn. Proj. U 186 (8), to H. H. Mass Constr. Co., Algonquin, Ill., **$600,042**. Bids 2/3. CD 2/9, under LB.

Miss., Gulfport—Harrison Co., Gulfport, Adam Bridge, to W. R. Fairchild, Hattiesburg, **$127,826**. Bids 3/6. CD 2/20/45.

New Jersey—State Hy. Dpt., Trenton, Lockatong Creek Bridge and multiple arch culvert, Delaware Twp., Hunterdon Co., to White & McCall, 75 West St., New York, N. Y., **$85,346**. Est. **105,592**. CD 2/17. Bids 3/9.

▲ **Oklahoma**—State Hy. Dpt., Oklahoma City, Zone 5, 0.456 mi. steel, concrete bridge, four lane with sidewalks over Arkansas River on Federal Urban Proj. U-591, U. S. Hy. No. 66, Tulsa Co., to M. E. Gilloz, Monett, Mo., **$1,135,987**. Est. $1,454,601. Bids 3/7, awarded 3/8. CD 2/28.

Washington—State Hy. Dpt., Olympia, reconstr. approach to Columbia River bridge at Longview, Cowlitz Co., to Guy F. Atkinson Co., 10 W. Orange Ave., S. San Francisco, Calif. **$810,310**. Bids 3/7. CD 2/3.

West Virginia—State Rd. Comn., Charleston, steel superstructure on concrete substructure, Bendah Bridge 1264, F 156 (6), Lewis Co., to Monty Brothers, St. Albans, **$73,151**; steel superstructure on concrete substructure, Osage Bridge 1789 F 313 (5), Monongalia Co., to Agnew Constr. Co., Ronceverte, **$164,333**. Bids 2/21, awarded 2/27.

STREETS AND ROADS

BIDS ASKED

STATE HIGHWAY LETTINGS

March 28
Iowa
Maryland
Massachusetts
Ohio
March 29
New York
March 31
Minnesota

April 4
Massachusetts
Oklahoma
Wisconsin
April 5
Louisiana
April 6
California

New York—B.A. 3/27—President Queens Boro, Queens Boro Hall, 120-55 Queens Blvd., Kew Gardens, Zone 15, grading, regrading, curbing, recurbing, laying and relaying sidewalks, construct receiving basins, etc., Austin St., 67 Ave., and 67 Rd.; relocation reconstruction Rockaway Blvd. from 246 St. to Nassau Co. line, incl. installing steel and c. i. water mains, Queens Boro.

Pennsylvania—B.A. 3/28—Pennsylvania Turnpike Comn., 11 N. 4 St., Harrisburg, construct approach and exit lanes to and from Hempfield and New Baltimore Service Stations on Pennsylvania Turnpike. Plans deposit $5. R. B. Stone, c/o owner, ch. engr.

Ia., Toledo—B.A. 3/29—Bd. Supervs. Tama Co., Toledo, 83,315 tons Class B crushed stone on road. Approx. $50,000. Ronald Child, co. engr.

† **Va., Norfolk**—B.A. 3/29—Pub. Wks. Office, Headquarters, Fifth Naval Dist., U. S. Naval Base, Zone 11, concrete sidewalk at U. S. Naval Base. Spec. 23897. Plans deposit $10.

Conn., Hartford—B.A. 3/30—Metropolitan Dist. Comn. Water Bureau, Bd. Contract & Supply, 115 Broad St., patching cuts in concrete and asph. pavements various towns, Contr. 172. Plans deposit $5. CD 10/31/45.

† **Virginia**—B.A. 3/31—Bureau Pub. Roads, Dpt. Commerce, 1440 Columbia Pike, Arlington.

Warren Co.—asph. 12.346 mi. Proj. 2A5B5, Shenandoah National Park. Plans deposit $10.

Fla., Pensacola—B.A. 4/4—City, c/o City Engineer, City Hall, 153,000 lin. ft. c. conc. curb and gutter, 212,000 sq. yd. sand clay base and 212,000 sq. yd. double bit. Plans deposit $25.

Neb., Omaha—B.A. 4/4—Douglas Co., Omaha, paving, grading covering sects. of 10 different roads. $265,000. Earl Whittaker, c/o owner, co. road engr. CD 2/6.

Calif., Eldridge—B. A. 4/28—State Div. Architecture, P. Wks. Bldg., Sacramento, grading, paving, curbs, walks, etc. at Sonoma State House. Anson Boyd, Sacramento, state archt.

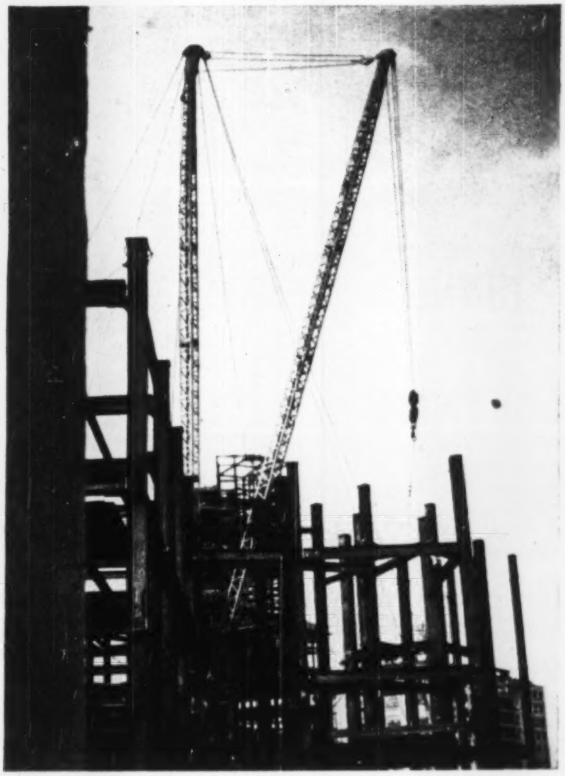
LOW BIDDERS

Alabama—State Hy. Dpt., Montgomery, Mar. 3, bit. and bridges 5.39 mi. Morgan X-Roads toward Brannon Springs, Etowah Co., from Floyd S. Milford, 1412 S. 13 St., Birmingham, **$115,189*****grading, draining, bridges 7.62 mi. between Oakman and part of U.S. 78 west of Jasper, Walker Co., from Carlton Constr. Co., Albany, **$233,442*****bit., bridges 4.7 mi. between Deer Park and Burbank, Washington Co., from Grant Constr. Co., Atlanta Hy., Montgomery, **$63,767*****grading, draining, bridge 13.4 mi. near Vina, Marion Co., from Mitchell & Tinsley Constr. Co., Birmingham, **$134,677**. CD 2/14.

California—State Div. Hys., Los Angeles, Mar. 9, mix on imported base material surf. 21.8 mi. between 2 mi. northwest of Niland and Riverside Co. line, Imperial Co., from Hensler Constr. Co., 816 Allen Ave., Glendale, **$388,297**; b. conc. on cement treated base 5 mi. 2 lane roadway, etc., on Santa Ana Freeway between Los Angeles Co. line and 0.2 mi. southeasterly off Euclid Ave., Orange Co., from Sully Miller Contg. Co., 1500 W. 7 St., Long Beach, **$466,258**. CD 2/14.

Kentucky—State Hy. Dpt., Frankfort, rejected bids Feb. 24, traffic bound river grav. and bank or creek grav., traffic bound surf. 0.96 mi., Paducah-Oaks-Symsonia Rd., S 75 (2), S.P. 73-412, McCracken Co. L. B. $115,840 or $114,642 respectively. CD 3/6.

(Continued on page 328)



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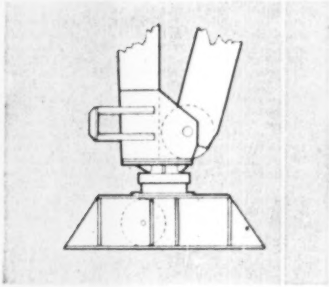

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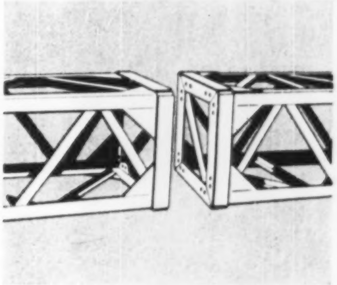

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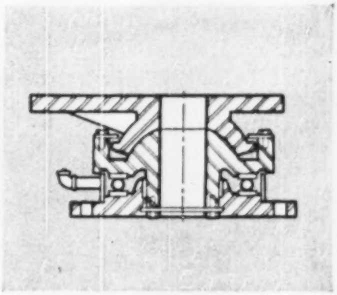

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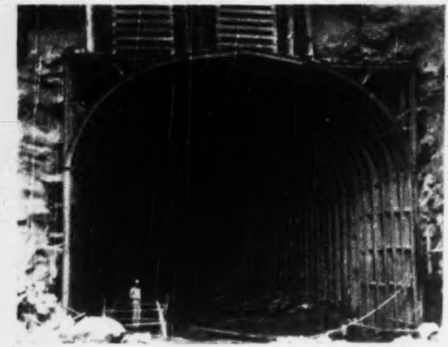

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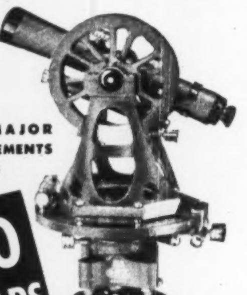

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(Continued from page 326)

Maryland—State Rds. Comn., Baltimore, rejected bids Feb. 21, bit. surf. Spec. B, along 2 sections hy. 1.91 mi. Kenwood Ave. beginning at Trump Mill Rd. and exten. southeasterly to Old Philadelphia Rd., State Rte. 7 and 0.61 mi. Joppa Rd. beginning at York Rd., U. S. Rte. 111, and exten. easterly to Providence Rd., Contr. B-602-415 and B-603-415, Baltimore Co., L. B. base **$93,290**, alternate **$92,074**; bit. Spec. B and and adjustments to storm water drainage, along 3 sections hy. in Cambridge, incl. 0.584 mi. along Dorchester Ave. beginning at State Rte. 343, D-221-115, 0.458 mi. along Maryland Ave. beginning at Sunburst Ave., State Rte. 50, and exten. westerly to Cambridge Creek, D-222-115, and 0.402 mi. along Washington St. beginning at Race St. and exten. westerly to High St. D-223-115, Dorchester Co., L. B. base **$62,702**, alternate **$56,897**. CD 3/1.

Massachusetts—Commonwealth of Mass., Dpt. P. Wks., Boston, Mar. 7, highway reconstruction, Main St., Agawam, from Sacco Constr. Co., Suffolk St., South Bellingham, **$93,782**; resurfacing State Hy., Edgartown and Oak Bluffs, from Colby Constr. Co., Beach Rd., Vineyard Haven, **$57,089**. CD 2/27.

Minnesota—State Hy. Dpt., St. Paul, Mar. 3, grading, paving, grav. base, bit. surf. and U.P. Bridge 6460 S.P. 7306-06 (TH 23-3) U-UG 328 (5), S.P. 7303-05 (TH 15-24), from Megarry Bros., St. Cloud, **$337,035**. CD 2/16.

Missouri—State Hy. Comn., Jefferson City, Mar. 8, from Koss Constr. Co., 205 Farm Bureau Bldg., Des Moines, Ia., c. conc. 1.591 mi. road from Frankfort S.E. toward Bowling Green, Route 61, Proj. F 257 (11)6, **$112,818**; c. conc. 2.569 mi. road from Frankford S.E. toward Bowling Green, Rt. 61, Proj. F 257 (12), both Pike Co., **$215,699**; c. conc. 2.879 mi. road from New London South, Rt. 61, Proj. F 66 (8), Ralls Co., **$147,980**. CD 2/15.

Nevada—State Hy. Dpt., Carson City, Mar. 7, highway imprvt. from approx. 11 mi. southwest of Battle Mountain to Battle Mountain, Landers Co., from Wells Cargo, Inc., Box 1411, Reno, **$167,321**; 2.238 mi. highway imprvt. on Kietz-Re Lane from Airport Rd. to 2 St., Washoe Co., from Isbell Constr. Co., S. Virginia Rd., Reno, **$108,840**. CD 2/24.

▲ **New Jersey**—New Jersey Turnpike Auth., 65 Prospect St., Trenton, Mar. 14, Contr. 7, grading, draining, structure 17.8 mi. in connection with constr. New Jersey Turnpike Sect. 2 between Woodbury Heights and Hartford, Gloucester, Camden and Burlington Counties, from A. I. Savin Constr. Co., 10 Village St., East Hartford, Conn., **$3,391,484**. CD 2/27.

▲ **Pennsylvania**—State Hy. Dpt., Harrisburg, Mar. 10, construct divided highway consisting of two 24 ft. wide lanes of c. conc. pavement on each side of 20 ft. wide earth divisor area and incl. 2 rein.-con. structures, grading, drainage 88 ft. wide; construct divided highway consisting of two 24 ft. wide lanes of c. conc. pavement on each side of 20 ft. width earth divisor area and incl. 2 rein.-con. structures, 31,193 ft. L.R. 333 (6-C, 6-B), T.R. U.S. 111 from near Harrisburg Airport at intersection of L.R. 250 to a point near Newberrytown, York Co., from Central Pennsylvania Quarry, Stripping & Constr. Co., 270 S. Pine St., Hazelton, **$2,189,934*****construct crushed aggregate base with bit. surf. 20 ft. and variable in width, 19,319 ft. L.R. 250 (3), T.R. 24, from point near Newberrytown to point near York Haven, York Co., from E. D. Plummer & Sons, Chambersburg, **$280,095*****c. con. pavement 46 ft. and variable in width, construct crushed aggregate base with bit. surf. variable in width, 7,135 ft. L.R. 802 (1) on the Greentree Rd. from point near intersection of Cochran Rd. northeasterly to point in Greentree Boro, Allegheny Co., from Frank Donatelli & Co., 205 N. Highland Ave., Pittsburgh, **$435,034**. CD 2/20.

Tex., Houston—Harris Co., Precinct 4, M. A. Lyons, comr., Courthouse, Feb. 28, 9 mi. flexible base with triple bit. surf. Memorial Dr., from W. E. Worthen, 720 Berry Rd., Houston, **$249,740**. Est. $300,000. CD 2/16.

Tex., Post—Garza Co., Post, Mar. 3, asph. 14 mi. roads, from Bryan & Hoffman, Box 461, Plainview, **$132,899**.

Ont., Toronto—City, H. E. McCallum, mayor, b. conc. Dufferin St. from north street line of Cloverlawn Ave. to north city limits, c. conc. three lanes and b. conc. Dufferin St. from St. Clair Ave. to north street line of Cloverlawn Ave., from George W. Porter Constr. Co. Ltd., Lawrence Ave., Approx. **$60,980** and approx. **$61,520** respectively***b. conc. Dufferin St. from north street line Regal Rd. to St. Clair Ave., from Kilmer Van Nostrand Ltd., 315 Eglinton Ave. W., Approx. **$70,547*****b. conc. Dufferin St. from south of Brandon Ave. to Davenport Rd. from Godson Contg. Co. Ltd., 1870 St. Clair Ave. W., Approx. **$53,301**. M. Stewart, city engr.

CONTRACTS AWARDED

California—State Div. Hys., Sacramento, grading, plant mix surf. on existing pavement and concrete treated base 4.5 mi., constr. curbed central dividing strips, 2 rein.-con. bridges to form a 4 lane divided hy. between Port Chicago Rd. and Pittsburg, Contra Costa Co., to Parish Bros., Box 6, Benicia, **$815,811**. Bids 2/23. CD 2/28, under LB.

Georgia—State Hy. Dpt., Atlanta, grading, paving 6.25 mi. Whigham-Hopeful Rd. beginning 3.3 mi. north of Whigham and exten. toward Hopeful, SA 1864 A (4), Grady Co., and grading, paving, 4.161 mi. Cuthbert-Benevolence Rd. beginning at State Rt. 50 in Cuthbert and exten. north toward Benevolence, S 0510 (1), Randolph Co., to Leo T. Barber, Moultrie, **$64,000** and **$65,000** respectively***grading, paving 6.283 mi. Maysville-Homer Rd., State Rt. 98 beginning in Maysville at intersection with State Rt. 52 and ending at intersection with

State Rt. 15 approx. 0.2 mi. south of Homer S. 0887 (1), Banks Co., to Lothridge Bros., Gainesville, **$104,107*****grading, paving 5.505 mi. Girard-McBean Rd., beginning at end of present paving approx. 4.6 mi. north of Girard and exten. toward McBeam S-0715 (1), Burke Co., to Weese & Weeks Constr. Co., McCaysville, **$54,367*****grading, paving 8.451 mi. Damascus-Arlington Rd., beginning at north city limits of Damascus and ending at jct. with state Rt. 62 in Arlington S 0506 (1), Early Co., to E. M. Beckham Constr., Co., Perry, **$124,503*****grading, paving 1 bridge 9.703 mi. Dawson-Pains Rd., State Rts. 49 and 45 beginning at intersection of State Rt. 55 north Dawson and exten. north toward Plains S 0644 (1) and S-1518 (1), Terrell Co., to Oxford Constr. Co., Albany, **$137,993*****grading, paving 5.117 mi. Loganville-Bold Spring Rd., beginning at State Rt. 10 in Loganville and exten. toward Bold Spring S-1308 (1), Walton Co., to E. A. Hudson's Sons, Bolton, **$76,048*****grading, paving and 2 bridges 10.296 mi. Sandersville-Deepster Rd., beginning in Sandersville at end of present paving of Haynes St. and ending at west city limits of Deepstep S 0689 (1), Washington Co., to Woodward-Letnz Constr. Co., Cedartown, **$232,844*****grading, paving 10.907 mi. Toombsboro-Milledgeville Rd., beginning in Toombsboro-Milledgeville Rd. beginning in Toombsboro at south city limits and exten. north toward Milledgeville to end of present excepting 1450 ft. at Commissioner Creek S 0686 (1), Wilkinson Co., to Wright Contg. Co., 504 25 Ave., Columbus **$109,126**. Grand total $968,888. Bids 3/3, awarded 3/7.

▲ **Minnesota**—State Hy. Dpt. St. Paul, grading, paving and U.P. Bridge 6590, S.P. 0503-16 (TH-23-23), S.P. 0504 (TH 23-23) and S.P. 0503 (TH 23-23)-F 234 (7) F 243 (5) and F.G. 234 (6), to E. W. Coons, Inc., Hibbing, **$595,512*****grading, paving S.P. 0608-27 (TH 75-6) S.P. 7805-21 (TH 75-6) S.P. 7806-13 (TH 75-6) and S.P. 7802-09 (TH 27-190) F 130 (5) F 164 (6) and F 343 (23), to Western Contg. Co., 400 Benson Bldg., Sioux City, Ia. **$702,485*****grading, paving, S.P. 3412-07 (TH-71-4) and S.P. 3412-08 (TH 71-4) F 488 (6) F 406, (19) to Central States Constr. Co., Crosby and Willmar, **$412,149*****grav. base and plant mixed bit. surf. S.P. 2102 (TH 29-29) F 262 (4), to Alexander Constr. Co., 4641 Hiawatha Ave., Minneapolis, **$64,687*****grading and U.P. Bridge 5496, S.P. 4001-06 (TH 13-13) and S.P. 4001-08 (TH 13-13) F 346 (8), to Herbison Constr. Co., Brainerd, **$86,406*****grading, S. 5409-03 (TH 81-175) and S.P. 5411-02 (TH 116-176) F 939 (3), to W. Griffis, Bagley, **$176,712*****crushed rock base and plant-mixed bit. surf. S.P. 2510-03 (TH 58-58) F 499 (4), to C. L. Nelson & Co., Brainerd, **$123,947*****grading, concrete box culverts, S.P. 6928-05 (TH 73-163), to Sorensen Bros., Albert Lea, **$274,064*****grav. base and plant mixed bit. surf., S.P. 4105-03 (TH 23-88) S.P. 4206-07 (TH 23-88) S.P. 4206-08 (TH 23-88) S.P. 4207-14 (TH 23-88) S.P. 4207-15 (TH 23-88) F 475 (8) F 758 (6), F 511 (4), to Duininck Bros. & Gilchrist, Olivia, **$224,860*****grav. base and plant-mixed bit. surf. S.P. 7404-03 (TH 30-82), to E. Olson & Sons, Albert Lea, **$109,223**. Grand total $2,769,945. Bids 3/3. CD 2/16.

▲ **New York**—Bureau Contracts & Accounts, Albany, paving and lighting sys. on Van Wyck Expressway, 2.51 mi. from Archer Ave. to Idlewild Airport, Queens Co., to Hudson Constr. Corp., 152 Onslow Pl., Kew Gardens, **$1,265,232**. Bids 1/25. CD 1/30, under LB.

North Carolina—State Hy. & P. Wks. Comn., Raleigh, c. conc. 3.22 mi. U.S. 29 and 74, from point 888 ft. west of city limits of Gastonia, east through Gastonia to point east of city limits, Proj. 6357, Gaston Co., to Wright Contg. Co., Box 1537, Columbus, Ga., **$605,488**. Est. $400,000-$500,000. Bids 3/2, awarded 3/9. CD 3/8, under LB.

▲ **Oklahoma**—State Hy. Dpt., Oklahoma City, Zone 5, to McConnell Constr. Co., Surety Bldg., Muskogee, stabilizing aggregate base and double bit. surf. 5.236 mi. farm-to-market road at Foss, Washita Co., **$100,079**, est. $107,291***to Broce Const. Co., Woodward, asph. stabilizing base, single bit. surf. 4 mi. St. Hy. 67 in Alfalfa and Woods Counties, **$75,681**, est. $82,535***to Smith Bros., Noble, stabilized aggregate base, double bit. surf. 6.906 mi. farm-to-market road, at Mangum, Greer So., **$119,988**, est. $158,998***to Mullinix Constr. Co., 1433 N.W. 5 St., Oklahoma City, Zone 6, stabilized aggregate base and double bit. surf. 5.774 mi. farm-to-market road at Colbert, Bryan Co., **$115,821**, est. $123,378***to Public Constr. Co., Manhattan Bldg., Muskogee, stabilized aggregate base, double bit. surf. 3.312 mi. farm-to-market road at Tahlequah, Cherokee Co., **$71,197**, est. $72,223***to Ryan-Richards Co., 1401 N.W. 5 St., Oklahoma City, Zone 6, minor structures, traffic bound surf. course 3.951 mi. farm-to-market road, Beckham Co., **$65,258**, est. $67,025; single bit. surf. 7.567 mi. farm-to-market road, at Duke, Harmon Co., **$146,938**, est. $154,055; stabilized asph. base, single bit. surf. 6.01 mi. State Hy. 75, south of Lamont, Grant and Garfield Counties, **$122,127**, est. $130,102; stabilized asph. base, single bit. surf. 5.431 mi. on No. 74, south of Lamont, Grant Co., **$94,058**, est. $109,351***to Cohenour Constr. Co., Ardmore, stabilized asph. base and single bit. surf. 5.774 mi. No. 299 north of Durant, Bryan Co., **$84,096**, est. $103,422***to G. & I. Constr. Co., Meeker, single bit. surf. 6.602 mi. farm-to-market road, Woods Co., **$130,320**, est. $150,095***to Starney Constr. Co., Altus, grading 5.236 mi. farm-to-market road at Foss, Washita Co., **$50,001**, est. $67,872. Grand total $1,175,564. Bids 3/7, awarded 3/8. CD 3/1.

Oregon—State Hy. Comn., Salem, surf. bit. macad. 6.74 mi. Barley Springs-Algoma sect. of The Dalles-California Hy., FAP F-25 (8), Kalamath Co., to Peter Kiewit Sons, Inc., Longview, Wash., **$853,882**. Bids 2/6. CD 2/16, under LB.

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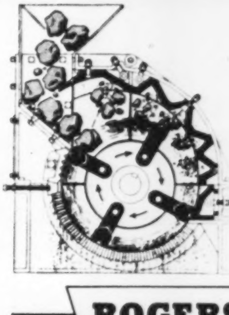

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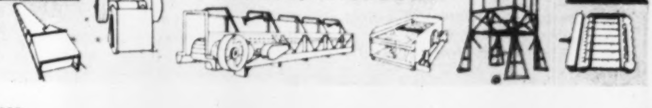

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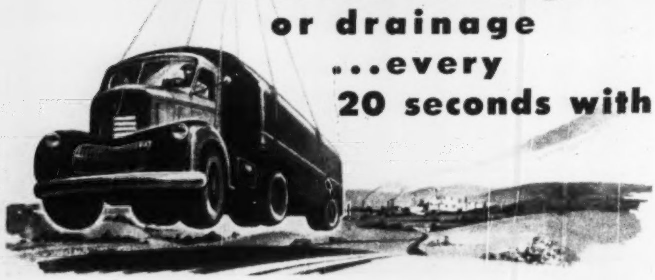

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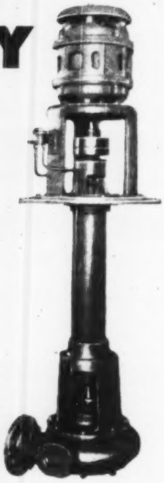

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Pennsylvania—State Hy. Dpt., Harrisburg, 7.51 mi. two lane macad. on relocation with excellent alignment and minimum grades with 10 ft. shoulders west of Red Rock in direction of Unityville with 70 ft. plate girder bridge over east branch of Fishing Creek, T. R. 115 and 539, in Jordan, Jackson and Sugarloaf Twps., Lycoming and Columbia Counties, to H. R. Miller Co., Inc., Box 1235, Lancaster, $907,542. Bids 2/17. CD 2/21, under LB.

Tex., Dallas—Dallas Co., Courthouse, farm to market road constr. and imprvs., Precinct 1, Approx. $75,000; Precinct 2, Approx. $65,000; Precinct 3, Approx. $50,000; Precinct 4, Approx. $80,000, force account, Grand total Approx. $270,000. H. Klinger, c/o owner, engr. CD 2/27.

Tex., Silsbee—Hardin Co., Silsbee, asph. surf. imprv. inside city limits, $75,000; hard surfaced roads in district, $145,000, force account. CD 1/27.

Washington—State Hy. Dpt., Olympia, bit. surf. tr., constr. 4 rein.-con. bridges on Primary State Hy. 10, Bridgeport to Leahy, F.A.S. S-0438 (1), Douglas Co., to C. E. Oneal, Ellensburg, $465,076. Bids 3/7, CD. 2/23.

Wash., Yakima—Yakima Co., Co. Courthouse, grading draining, ballasting and crushed stone surf. 6.44 mi. roads in Terrace Heights Dist. and manufacturing, stockpiling crushed stone, to R. Weist, Yakima, $109,565, est. $132,000.

West Virginia—State Rd. Comn., Charleston, traffic bound 3.32 mi. North Sand Branch, Moyner Rd., Proj. 5950, Raleigh Co. to David S. Griffith, Spanishburg, $109,105. Bids 2/21, awarded 2/23.

EARTHWORK, WATERWAYS

BIDS ASKED

† **Maine**—B.A. 3/29—U. S. Eng., Army Base, Boston 10, Mass., maintenance dredging, York Harbor, York River, located about 220 ft. east of Braggon Island, CIVENG 19-816-50-53.

† **Ohio**—B.A. 3/29—U. S. Eng., Madison Ave. and 8 St., West Huntington 18, W. Va., dwelling, utilities, Burr Oak Reservoir Proj., East Branch of Sunday Creek, Serial No. CIVENG-46-022-50-86.

N. S., Glace Bay—B.A. 3/29—Acting Secy., Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., Breakwater reconstr. Approx. $126,000. Plans deposit $25. R. Blais, c/o owner, engr. CD 3/18/49.

P. E.I., Summerside—B.A. 3/29—Acting Secy., Dpt. P. Wks., Hunter Ottawa, Ont., boat harbor at Skinners Pont, Approx. $110,000. Plans deposit $20. R. Blais, c/o owner, engr.

† **Louisiana**—B.A. 3/30—U. S. Eng., foot of Prytania St., New Orleans, Zone 9, approx. 1,250,000 cu. yd. hydraulic fill, etc. on East Atchafalaya Basin Protection Levee below Morgan City, Item E120B, Avoca Island Levee, St. Mary Parish, CIVENG 16-047-50-222. Extended date. CD 3/10.

LOW BIDDERS

† **New Mexico**—Bureau Reclamation, Dpt. Interior, Fort Sumner, Mar. 2, diversion dam on Pecos River, 700 ft. concrete gravity structure 40 ft. high and sluiceway and 2 radial gates 17x20 ft., Ft. Sumner, from A. L. Murphy & Nathan A. Moore, 105 E. Garvey St., San Gabriel, Calif., Unit 1, $457,760.

† **Texas**—U. S. Eng., 606 Santa Fe Bldg., Galveston, cancelled bids to have been opened about Mar. 17, landscaping and cleanup, Hords Creek Dam and Reservoir, CIVENG-41-243-50-172. CD 2/23.

Tex., Iowa Park—City and Wichita Co. Water Control & Imprvt. Dist. 3, Iowa Park, Mar. 7, earth fill dam 5 mi. 8-in. c.i. lines for main pump station, from J. R. Fanning, 1712 13 St., Lubbock, $100,724. Est. $125,000. Ernest L. Andrews, c/o owner, engr.

CONTRACTS AWARDED

† **California**—Bureau Reclamation, Dpt. Interior, Bldg. 1-A, Denver Federal Center, Denver, Colo., 205,670 lin. ft. 12- to 72-in. rein.-con. pipe for Ivanhoe Irrigation Dist., Unit 3, and Southern San Joaquin Municipal Utility Dist., Unit 3, Friant-Kern Canal distribution system, Delano, Central Valley Proj., Spec. 2908, to Central Valley Concrete Pipe Co., Stockton, Calif., $768,077. Bids 2/21, awarded 3/7. CD 2/28, under LB.

† **Pennsylvania**—U. S. Eng., 24 and Maryland Ave., Baltimore 8, Md., flood protection, Levee Unit 6 C, Sect. 1, Hill St. and Ecks Run Pump Station, Sect. 2, Main St. Pump Station, Hagermans Run conduit, Lycoming Co., Serial No. CIVENG 18-020-50-19, to Lycoming Constr. Co., Williamsport, $936,469. Est. $1,400,000. Bids 2/15. CD 2/24, under LB.

Ont., Little Current—Dpt. P. Wks., Hunter Bldg., Ottawa, dredging, to Canadian Dredging & Dock Co., Ltd., Harbor Bldg., Toronto, $599,440. Bids 12/7. Correction (contractor). CD 12/13, under CA.

AIRPORTS

BIDS ASKED

† **Mich., Selfridge Air Force Base (Br. Mount Clemens)**—GROUND APPROACH FACILITIES—B.A. 3/28—U. S. Eng., Merchandise Mart, Chicago 54, Ill., ground approach facilities, incl. all related work necessary and appurtenant thereto, Serial No. Eng-11-032-50-8. CD 3/8.

N. Y., Idlewild—GLIDE PATH BLDG.—B.A. 3/31—Civil Aeronautics Admin., Federal Bldg., Idlewild, glide path bldg. at New York International Airport. CD 3/22/[illegible]

LOW BIDDERS

† **Calif., McClellan Field**—WATER SUPPLY for SPRINKLER SYSTEM—U. S. Eng., 180 new Montgomery St., San Francisco, Mar. 9, water supply for sprinkler sys. at McClellan Air Force Base. Spec. 04-203-50-105, from Automatic Sprinkler Corp. of America, Box 360, Youngstown, O., **$175,100.**

Ill., Alton—AIRPORT—Civic Memorial Airport of Alton, Alton, Mar. 10, second stage construction contract, airport, from Edwardsville Constr. Co., Edwardsville, **$319,813.**

PUBLIC BUILDINGS

BIDS ASKED

Mo., Columbia — CLASSROOM — B.A. 3/29—Curators University of Missouri, Leslie Cowan, secy., Jesse Hall, brick, concrete, stone, steel classroom bldg., University of Missouri, on campus between Education and Engineering Bldgs. $600,000. Extended date. Jamieson & Spearl, 1696 Arcade Bldg., 812 Olive St., St. Louis, Zone 1, archts. CD 2/10.

Va., Charlottesville—ACADEMIC—B.A. 3/29—At office Colgate W. Darden, Jr., pres., University of Virginia, Charlottesville, academic bldg. for State of Virginia, Richmond. Approx. $500,000. Eggers & Higgins, 542 Fifth Ave., New York, N. Y., archts. CD 5/4.

▲ **Va., Charlottesville** — SCHOOL — B.A. 3/29 — Supt. Grounds & Buildings, University of Virginia, Charlottesville, school. $1,500,000. Plans deposit $50. Eggers & Higgins, 542 Fifth Ave., New York 18, N. Y., archts. CD 10/11/44.

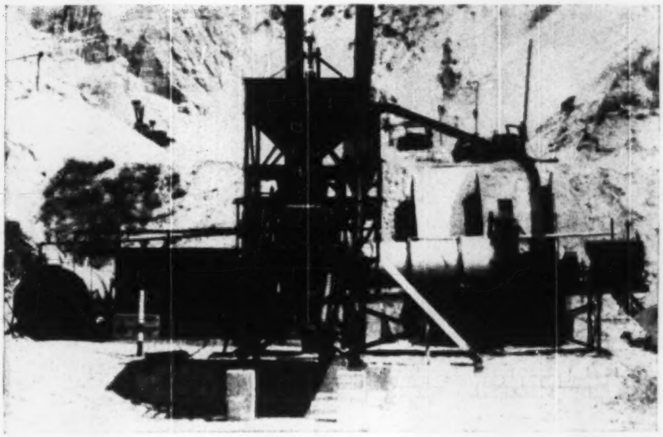
Que., Chandler—POST OFFICE etc.—B.A. 3/29—Acting Secy. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., post office, etc. Approx. $300,000. Plans deposit $50. G. Brault, c/o owner, engr.

† **Miss., Greenwood**—SHOP, etc.—B.A. 3/30—U. S. Navy, Naval Base, Charleston, S. C., modification and enlargement shops, classrooms, constr. rein. con. fdns., steel bases utilities facilities throughout Naval Reserve Training Center, NOY 20123. Spec. 23824. Plans deposit $10.

▲† **N. M., Los Alamos**—DWELLINGS—B.A. 3/30—U. S. Atomic Energy Comn., Los Alamos, 104 single and multiple dwellings, total 184 units, appurtenances, $3,000,000. Extended date. CD 2/7.

Tenn., Murfreesboro—DORMITORY—B.A. 3/30—State Purchasing Dpt., State Office Bldg., **Nashville, dormitory** at Middle Tennessee State College. Approx. $250,000. Plans deposit $200. Hart, Freeland & Roberts, 3rd National Bank Bldg., Nashville, archts. CD 2/9.

† **Wash., Richland**—TEMPLE—B.A. 3/30—U. S. Eng., 19 E. Poplar St., Walla Walla, rehabilitating Masonic Temple. CIVENG-45-165-40-106.



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Calif., Willits—SCHOOL—B.A. 3/31—Willits Unified Elementary School Dist., Willits, 3 wings with interconnecting corridors, wood frame, stucco with concrete slab, Willits Elementary School. Approx. $250,000. Plans deposit $15. C. A. Caukins Jr. & Assoc., Rosenberg Bldg., Santa Rosa, archts. C. J. Jefferson Sly, 580 Market St., San Francisco, engr. CD 10/22/48.

Mass., Malden—HOUSING—B.A. 3/31—Malden Housing Auth., George M. Edwards, chn., 90 Fairfield Ave., 2 story, bsmnt., brick, frame housing, SAP Malden 200-2. Plans deposit $50. C. F. Springall, 90 Park St., archt. CD 2/13.

Calif., Hemet and El Centro—ARMORIES—B.A. 4/4—State Div. Architecture, P. Wks. Bldg., Sacramento, 1 story Type A rein.-con. armory at Hemet and Type C, 14,000 sq. ft. armory at El Centro. Plans deposit $25. Anson Boyd, Sacramento, state archt.

LOW BIDDERS

Conn., Enfield—HOUSING—Town of Enfield Housing Auth., P. Joseph Peraro, chn., Mar. 2, 72 family units 36 frame duplex houses, Housing MR-26, from Beaudry Constr. Co., 223 East St., Springfield, Mass., $592,000.

▲ **Conn., Norwich**—HOUSING—City of Norwich Housing Auth., W. B. Barrett, chn., 118 two story, bsmnt. family unit garden apartments, Hillside Terrace and Hamilton Ave., from Kay Constr. Co., 219 Ridgefield St., Hartford, $1,064,000. CD 2/28.

Md., Middletown—SCHOOL—Frederick Co., School Bd., E. Church St., Frederick, 1 and 2 story, bsmnt., 300x380 ft., brick, concrete, steel Middletown High School, from L. J. Keller, Jefferson, $727,000. CD 2/2.

Miss., Canton—PLANT—City cancelled bids to have been opened Mar. 7, milk processing plant. Will re-advertise. CD 2/17.

▲ **Neb., Bellevue**—GENERATING PLANT—Loup River Public Power Dist., Columbus, Mar. 14, superstructure for generating plant, from Bates & Rogers Constr. Co., 600 W. Jackson St., Chicago 6, Ill., $3,000,000. CD 3/8, under Industrial Bldgs.

▲ **N. Y., Astoria**—HOUSING—New York City Housing Auth., 63 Park Row, New York, Zone 12, general contract 12 bldgs., Sect. II, Astoria Houses, from Willcox, Bein, Fish & McHugh, Inc., 25-20 41 Ave., Long Island City, $3,639,000***heating and ventilating, from Norman Heating Co., Inc., 820 10 Ave., New York, Zone 19, $384,000***plumbing, from Novak & Rehner, Inc., 623 Tenth Ave., New York, Zone 19, $389,700. CD 3/2.

N. C., Raleigh—EDUCATION—Bd. Public Building & Grounds, George B. Cherry, secy., Agriculture Bldg., Mar. 9, general contract, education bldg. addn., Salisbury and Edenton Sts., from H. L. Coble Constr. Co., Box 2040, Greensboro, $595,154. CD 2/10.

Tex., Lubbock—PLANT—City, Feb. 23, electric light and power plant expansion, boilers only, from Wickes Boiler Co. Div., 515 N. Washington St., Saginaw, Mich., $125,480***condenser only, from Condenser Service & Eng. Co., 95 River St., Hoboken, N. J., $61,170***cooling tower only, from The Marley Co., Inc., Fairfax and Marley Rd., Kansas City, Kan., $38,984***turbo-generator only, from Allison & Sears, 5647 Navigation St., Houston, $301,930. CD 2/9.

S. C., Spartanburg—AUDITORIUM—The Spartanburg Auditorium Comn., c/o low bidder, Mar. 6, memorial auditorium, from General Constr. Co., Palmetto Bldg., Columbia, $850,000. CD 2/24.

CONTRACTS AWARDED

▲ **Calif., Sacramento**—HOSPITAL—Sacramento Co., Courthouse, general contract 4 story 400 bed rein.-con., steel County Hospital Addn., to Lawrence Constr. Co., & Edwin J. Mackey, 720 Howe St., $1,061,790. Bids 3/1. CD 3/7, under LB.

▲ **Md., College Park**—CHEMISTRY CLASSROOM, etc.—Dpt. P. Imprvt., 506 Park Ave., Baltimore, 5 story, structural steel, rein.-con., brick, cinder block chemistry classroom teaching and research laboratory bldg., air conditioning, to Geo. H. Hyman Constr. Co., 1010 Vermont Ave. N. W., Wash., D. C., $1,488,000 with alternates. Bids 2/23. CD 2/28, under LB.

Md., Middletown—SCHOOL—Frederick Co. School Bd., 105 E. Church St., 1 and 2 story, bsmnt., 300x380 ft., brick, concrete, steel Middletown High School, to L. J. Keller, Jefferson, $704,174. CD 3/13 under LB.

N. Y., Cambridge—SCHOOLS—School Dist. 10, Cambridge School, Cambridge, elementary and high school, to Sano-Rubine Constr. Co., 616 Delaware Ave., Albany, $513,501. Bids 3/1. CD 2/10.

N. Y., Kingston—SCHOOL—Bd. Educ., Kingston High School, Kingston, school, to I. & O. A. Slutzky, Hunter, $909,535. Bids 3/2. CD 2/10.

▲ **N. Y., New York**—SCHOOL—School Bldgs. Design & Construction, 49 Flatbush Ave. exten., Brooklyn, Zone 1, general contract, plumbing and drainage, heating and ventilating, electrical work and lighting fixtures for P. S. 108, Madison Ave. between E. 108 and 109 Sts., to Caristo Constr. Co., 26 Court St., Brooklyn, Zone 2, $1,925,625. Bids 2/24. CD 3/3, under LB.

▲† **Utah, Salt Lake City**—HOSPITAL—U. S. Eng., 180 New Montgomery St., San Francisco, Calif., 500 bed rein.-con., brick hospital, 4 residential bldgs., one boiler plant and shop, one kitchen bldg., one recreational bldg., one theatre bldg., one laundry, one gas meter house incl. utilities for Veterans Admin., Vermont Ave. between H and I Sts., N. W., Wash. 25, D. C., to Wunderlich & Curlett, 820 W. Esther St., Long Beach, Calif., and Charles H. Tompkins Co., 907 16 St. N. W., Wash., D. C., $7,898,000. Bids 2/16. CD 2/20, under LB.

▲ **Wash., Seattle**—POWERHOUSE, etc.—City, County-City Bldg., Zone 4, excav. for Ross powerhouse and tunnels, Newhalem, to Peter Kiewit Sons' Co., 1300 Alona St., Seattle, $1,435,542. Bids 3/1, awarded 3/8. CD 3/9, under LB.

† **Wash., Seattle**—OPERATIONS, etc.—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, operations bldg., power bldg., tower, central heating plant, barracks, mess hall, etc.; for Station P/1A, to Howard S. Wright Co., Inc., 420 Yale Ave. N., $389,920. Bids 3/7.

N. S., Halifax—LABORATORY, etc.—Dpt. Hys. & P. Wks., Halifax, 3 story, bsmnt., 65x147 ft., rein.-con. laboratory and classroom bldg. at Nova Scotia Technical College, Spring Garden Rd., to Fundy Constr. Co., Ltd., Islesville and Russell Sts., Halifax*** plumbing and heating, to Power Brothers, Lunenburg ***electrical trade, to Provincial Electric Co., Ltd., 11 Hollis St., Halifax. Total est. $700,000. C. St. J. Wilson, Roy Bldg., Halifax, archt. CD 4/26/49.

Que., Quebec City—SCHOOL—School Comn., 20 Richelieu St., 2 story, 60x242 ft., rein. con., brick, stone school Parish of St. Albert le Grand, to Barnabe & Sons Ltd., 195 12 St., Quebec City, $587,753. CD 11/23.

Que., Quebec City—SCHOOL—School Comn., E. Huot, secy., 20 Richelieu St., 3 story, 213 ft. frontage, rein. con., brick, stone school and residence for teachers (boys and girls) in Parish of St. Jean de Baptiste, St. Jean and Delingy Sts., to G. H. Montming Inc., 302 Richelieu St. Approx. $438,500. CD 10/24/47.

COMMERCIAL BUILDINGS

BIDS ASKED

▲ **N. H., Greenfield** — HOSPITAL — B.A. 3/30 — New Hampshire Society for Crippled Children & Handicapped Persons, 7 Prospect St., Nashua, rehabilitation hospital for crippled children, Mount Crotchet. Approx. $1,000,000. Walter F. Bogner, 1430 Massachusetts Ave., Cambridge, Mass., and Alden Parker, Clinch & Crimp, 177 State St., Boston, Mass., archts. Hubbard, Lawless & Blakely, 177 State St., Boston, Mass., engrs.

N. Y., Woodside—CHURCH—B.A. 3/30—St. Theresa Roman Catholic Church, 45-20 45 St., church, $650,000. William J. Boegel, 12 E. 48 St., New York, Zone 17, archt.

Miss., Jackson—Y. W. C. A. BLDG.—B.A. About 4/1—Y. W. C. A., c/o R. W. Naef, archt.-engr., Masonic Temple, Y. W. C. A. bldg., $400,000.

La., Metairie—SCHOOL—B.A. 4/4—St. Francis Xavier Church, c/o Paul G. Charbonnet, Jr., archt., 624 Lowerline St., New Orleans, parochial school facing Betz Pl. between Avenues A and B. $250,000. CD 2/15.

▲ **Tex., Dallas**—APARTMENT—Bids Asked—Edward T. Dicker, 101 Laurel Land Lane, 12 story, bsmnt.

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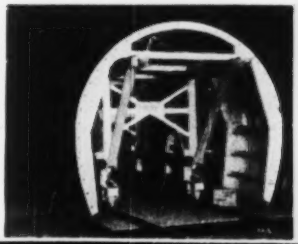

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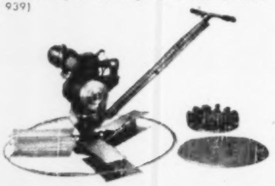

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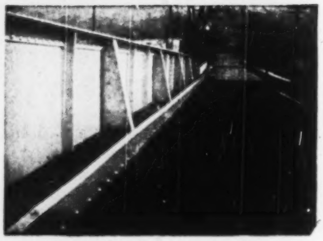

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apartment. $1,750,000. John N. Graham, 1010 20 St. N. W., Wash. D. C., and George N. Marble & R. M. Strode, 3908 Capitol St., archts. CD 12/2.

▲ **Tex., Ft. Worth**—APARTMENT—Bids Asked—Westchester Apartments, Med. Arts Bldg., c/o Judge E. P. Hall, apartment. $3,000,000. Wilson & Patterson, 202 Majestic Bldg., archts. CD 1/4.

SOON LETS CONTRACT

N. Y., Brooklyn—SCHOOL—St. Johns University, 75 Lewis St., soon lets contract school addn. $350,000. Henry V. Murphy, 1 Hanson Pl., archt. CD 11/7.

N. Y., New York—CHURCH—B. A. 3/28 Eighth Church of Christ Scientist, 105 E. 77 St., New York church. $300,000. Charles D. Faulkner, 307 N. Michigan Ave., Chicago, Ill., archt.

LOW BIDDERS

Conn., Meriden—HOSPITAL—Meriden Hospital, 181 Cook Ave., 3 story, brick, steel, concrete hospital addn., Cook Ave., from H. Wales Lines Co., 134 State St. **$923,769.** CD 2/20.

N. C., Wilmington—OFFICE—Seacoast Realty & Development Co., c/o Charles C. Hartmann, archt., Greensboro, office, from C. M. Guest & Sons, Greensboro. **$439,357.** CD 1/11.

N. C., Winston-Salem—OFFICE—Security Life & Trust Co., c/o Macklin & Stinson, archts., Wachovia Bldg., office, from H. L. Coble Constr. Co., Greensboro. **$445,000.** CD 2/1.

Tex., Dallas—MERCANTILE—Nieman-Marcus Co., Main and Ervay Sts., Feb. 28, mercantile, from A. J. Rife Constr. Co., 2608 Inwood Rd. $264,000.

▲ **Alta., Edmonton** — THEATRE — Famous Players Canadian Corp., Royal Bank Bldg., Toronto, Ont., rejected bids Jan. 28, 1,800 seating theatre, Jasper Ave. **$1,000,000.** Will re-advertise in April. CD 1/26.

CONTRACTS AWARDED

Ark., North Little Rock—HOUSES—Better Built Homes, Inc., Glover Home, Little Rock, 54 four and five room houses in Levy. Owner builds, **$400,000.**

Calif., Los Angeles—DWELLINGS—Arleta Homes, Inc., 444 N. La Brea Ave., 107 frame, stucco dwellings, Filmore, Louvre, Weidner, Sharp and Bartel Sts., Patric Rkna, Lew Aves. Owner builds. **$528,300.** Calif. National Builders, 128 S. LaBrea Ave., engr.

Calif., Los Angeles—DWELLINGS—Goodco, Inc., 7462 Lankershim Blvd., 144 frame, stucco dwellings, Chase St., Darrington, Greenbush, Gullo and Varisa Aves., to Burco Inc., 7462 Lankershim Blvd., **$770,500.**

▲ **Calif., Los Angeles**—OFFICE, etc.—Tishman Realty & Constr. Co., Inc., 445 Park Ave., New York, N. Y., 12 story office and 2 story garage, Wilshire Blvd., Mariposa Ave. to Irola St., to C. L. Peck, 816 W. 5 St., **$20,000,000.** Claude Beelman, 325 W. 8 St., archt.

Calif., Rivera—DWELLINGS—Anatel Square, Inc., 8236 E. 2 St., D. Downey, 121 frame, stucco dwellings, in Tract 14395, to Guild Homes, 8236 E. 2 St., Downey, **$724,260.**

▲ **Del., Wilmington** — APARTMENTS — Clifton Park Manor, Inc., du Pont Bldg., apartment group, incl 920 brick units, separate contracts **$5,924,000.** A. D. Lueders, 1513 N. Uhles St., Arlington, Va., archt. CD 9/13.

Fla., Miami—HOMES—Artbuilt Homes, Inc., 711 Langford Bldg., 163 homes 2nd section, Grapelane Heights, Owner builds, **$600,000.**

▲ **Fla., Tampa**—HOMES—Davis Island Corp., c/o A. M. Watson, archt., 1529 Grand Central Ave., 300 homes, to Burdett-Perry, Inc., c/o archt. Approx. **$4,000,000.**

Fla., Tampa—APARTMENT UNITS—Owner, c/o contractor, 120 apartment units for colored, to Paul Smith Constr. Co., 310 N. Rome Ave., Tampa, **$500,000.**

▲ **Ga., Atlanta**—APARTMENT UNITS—Caldwell Village, c/o John Summer, archt., 737 W. Peachtree N. E., 256 apartment units in Ashford Park Section, to McDonough Constr. Co. of Georgia, 7056 Peachtree Rd. N. E., Approx. **$1,700,000.**

▲ **Ga., Atlanta** — APARTMENT UNITS — High Point Apartments, Inc., c/o Pearson, Tittle & Narrows, archt., First National Bank Bldg., Montgomery, Ala., 452 apartment units to Algernon Blair, 806 Henry Gradey Bldg., **$2,500,000.**

▲ **Ga., Atlanta**—APARTMENT UNITS—The Waluhaje Apartments, c/o contractor, 133 apartment units, to W. H. Aiken, Inc., 158 Auburn Ave. N.E., Approx. **$1,100,000.** P. N. Wilkinson, 519 Western Union Bldg., archt.

Ga., Atlanta—APARTMENT UNITS—West Lake Apartments, c/o contractor, 80 apartment units, to W. H. Aiken, Inc., 158 Auburn Ave. N.E., **$550,000**

▲ **Ga., Columbus**—APARTMENT UNITS—Buena Vista Estates, Inc., J. E. Page, pres., c/o contractor, 150 apartment units, to Jordon Contg. Co., Andrews Rd. Approx. **$1,100,000.**

Ga., Columbus—HOMES—W. G. Salter, 740 Linwood Blvd., 50 homes. Owner builds. Approx. **$400,000.**

Ga., Columbus—APARTMENT UNITS—Southland Plastering Co., c/o Pearson, Tittle & Narrows, First Nat'l. Bank, Montgomery, Ala., 100 apartment units, Old Ft. Benning Rd. Owner builds. **$590,000.**

▲ **Ga., Savannah**—APARTMENT UNITS — Lamara Apartments, c/o Thomas & Hutton, engrs., 120 E. St. Julian St., 150 apartment units. Owner builds **$1,182,000.** CD 12/9.

▲ **Ga., Savannah**—APARTMENT UNITS—Nelson Apartments, c/o Thomas & Hutton, engrs., 120 E. St. Julian St., 220 apartment units. Owner builds **$1,400,000.**

Ga., Warner Robins—HOMES—Ignico Park, Inc., c/o Calvin B. Oliver, Macon, 150 homes, Owner builds. Approx. $750,000.

▲ **Ill., Chicago**—HOMES—Packinghouse Workers of America, 608 S. Dearborn St., Zone 5, 1,000 homes, 2 story brick rowhouses; to Federal Constructors, 173 W. Madison St., Zone 2, and Republic Constr. Co., 173 W. Madison St., Zone 2. Approx. $10,000,000. Awarded 3/1. Friedman, Alschuler & Sincere, 223 W. Jackson St., Zone 6, archts.

Md., Baltimore—CHURCH, etc.—Grace North Baltimore Methodist Church, Roland Ave. and Oakdale Rd., 2 story, bsmnt., approx. 475,000 cu. ft. 47x202x40 ft. L-shaped brick Colonial type church, parish hall and Sunday School bldg.; to Thomas Hicks & Sons, 106 W. Madison St., $400,000, Est. $375,000. Bids 2/14. CD 2/1.

▲ **Mass., Lexington**—HOUSING—Pleasant Associates, William Butler, 141 Mt. Vernon St., Arlington, 500 frame family units, Wheeler Property, Owner builds. $5,000,000. G. B. Northrup, 266 Lake St., Belmont, archt. CD 2/10.

▲ **Minn., Minneapolis**—APARTMENTS—Valley Village, Inc., F. R. Svenson, pres., c/o G. W. Bardhorst, archt., 1011 Currie Ave., Minneapolis, general contract six 2 story, bsmnt. 18 unit apartments, Olson Hy. and Belt Line, to Sebco, Inc. and Enacc, Inc., 1011 Currie Ave. Est. $1,000,000.

▲ **Mo., Kansas City**—CENTENNIAL—J. A. Bruening Co., Bd. of Trade Bldg., Zone 6, 4 floors, 41,000 sq. ft., centennial bldg., 10 and Central Sts., to J. E. Dunn Constr. Co., 929 Holmes St., Kansas City, Mo. Approx. $1,750,000. Frank E. Trask, Bd. of Trade Bldg., Kansas City, Mo., Zone 6, archt.

Mo., St. Louis—CHURCH—St. Gabriel the Archangel Parish, Rev. Msgr. R. B. Schuler, pastor, 4710 Tamm Ave., general contract bsmnt., tower, 131x150 ft. stone, concrete steel church, 2 story, bsmnt., 66x75 ft. rectory, to G. Ralio Contg. Co., Inc., 500 Kemper Park, Zone 9, $519,532. Bids 2/18. CD 2/27 under LB.

▲ **N. M., Albuquerque**—DWELLINGS—Alba Housing Co., 846 S. Broadway, Los Angeles, Calif., 700 dwellings between San Pedro Dr., Roosevelt, Morrow and Louisiana Aves. Owner builds. Approx. $5,000,000.

N. Y., Brooklyn—APARTMENT—Lanson Realty Corp., 16 Court St., Zone 2, 6 story apartment, 734-760 Rogers Ave. and 146-61 Linden Blvd. Owner builds. $828,000. CD 2/24.

▲ **N. Y., Elmhurst**—APARTMENT—Elmhurst Gardens, Inc., c/o Kavy & Kavvitt, Inc., archt., 44 Court St., Brooklyn, Zone 2, 6 story apartment, MacNish St. and Elmhurst Ave. Owner builds. $1,176,000. CD 2/24.

▲ **N. Y., Hicksville**—HOUSES—Duffy Homes, Inc., Mario Vidoni, pres., 112-42 Hannibal St., St. Albans, 165 houses on 34 acre site, Old Country Rd. and Underhill Ave. Owner builds. Approx. $1,000,000.

▲ **N. Y., Jackson Heights**—APARTMENT—Joseph Gerla & Charles S. Freeman, c/o H. I. Feldman, archt., 415 Lexington Ave., New York, Zone 17, two 6 story apartments, 35 Ave. between 85 and 86 Sts. and 35 Ave. between 86 and 87 Sts. Owner builds. $1,000,000. CD 2/15.

▲ **N. Y., Kew Gardens**—HOUSES—Park Drive Terrace, Inc., c/o Schulman & Soloway, archts., 4 Court Square, Brooklyn, Zone 2, 68 houses, 135 St. and 73 Terrace. Owner builds. Approx. $1,000,000.

▲ **N. Y., Lawrence**—HOUSES—Ben Lee & Manny Rabal, c/o Matern & York, archts., 90-04 161 St., Jamaica, 60 one family houses in Sutton Park sect. Owner builds. Approx. $1,000,000.

N. Y., New York—APARTMENT—Hyed Realty Corp., c/o George G. Miller, archt., 67 W. 44 St., New York, Zone 18, apartment, 2-4 Amsterdam Ave. and 503-505 W. 59 St. Owner builds. $550,000.

▲ **N. Y., New York**—APARTMENT—Kleban & Seaver, c/o Emery Roth & Sons, archts., 18 E. 48 St., Zone 17, 12 story apartment, 30 E. 37 St. Owner builds. $1,000,000.

O., Bay Village—HOMES—Sutherland Constr. Co., 29225 Lake Rd., fifty 1½ story frame homes, Glen Park Ave. and other locations, separate contracts. $565,000.

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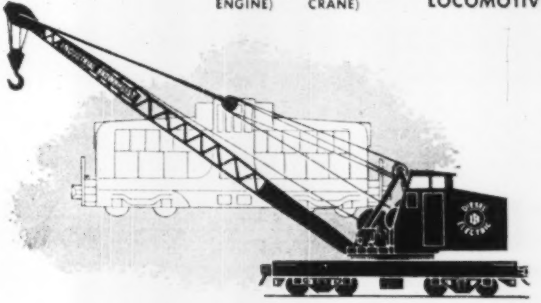

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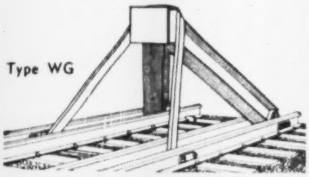

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O., Cleveland—DEPARTMENT STORE—Federal Department Stores, 444 Willis St., Detroit, Mich., 1 story, bsmnt., 100x300 ft. brick, steel department store imprvs. at Lee and Harvard Rd., to J. A. Utley Co., 723 New Hampshire Rd., Royal Oak, Mich. **$900,000.** Bids 1/20, awarded 2/15. CD 1/18.

O., Lynhurst—HOMES—Miller Olson Builders, 4226 Mayfield St., South Euclid, 30 two story bsmnt., frame homes, Henning Dr., separate contracts. **$500,000.**

▲ **O., Parma**—HOMES—Gerson Homes, Inc., 8022 Broadway, Cleveland, 100 frame homes, Ridgewood Dr., separate contracts. **$1,590,000.**

O., South Euclid—HOMES—Gerome & Capretta Builders, Inc., 2620 Noble Rd., Cleveland, 35 brick, frame, stone ranch type homes, 1315 Green Rd., separate contracts. **$595,000.**

O., Willamick—HOMES—Stakich Const. Corp., 15813 Waterloo Rd., Cleveland, forty-seven 1½ stories homes, E. 322 St. and E. 325 Sts., separate contracts. **$470,000.**

Ore., Portland—APARTMENT—Rose Plaza Corp., 2199 N. W. Everett St., 48 unit 7 story apartment, 22 and N. W. Everett Sts., to Leo S. Wynans, 3585 N. E. Shaver St., **$500,000.** Awarded 3/8. Don Byers, Builders Exchange Bldg., archt.

S. C., Anderson—APARTMENT—Owner, c/o contractor, 150 apartment units in southwestern sect. of city for Negroes, to Daniel Constr. Co., Greenville, Approx. **$750,000.**

▲ **Tex., Houston**—APARTMENT—Pleasantville, Inc., c/o Melvin A. Silverman, 6110 Almeda Rd., 250 unit apartment, off 8200 block Market St. Rd. Owner builds. Approx. **$1,450,000.** CD 1/6.

Tex., San Antonio—APARTMENT—Rex Corp., c/o Wm. C. King, 1230 N. St. Marys St., 12 two story 89 unit apartments, to C. L. Browning, Jr., Travis Bldg., **$610,000.** CD 3/9.

▲ **Alaska, Anchorage**—APARTMENT—C. T. Brady, 707 Spokane St., Seattle, Wash., and A. C. Swalling, Anchorage, 139 unit 1200 L St. apartment, day labor. **$1,561,400.** E. W. Morrison, 719 2nd Ave. Bldg., Seattle, Wash., archt. CD 2/6.

▲ **Alaska, Anchorage**—APARTMENT—E. D. Coffey, Anchorage, and C. T. Brady, 707 Spokane St., Seattle, Wash., 143 unit Coffey House Apartment, day labor. **$1,547,000.** E. W. Morrison, 719 2nd Ave. Bldg., Seattle, Wash., archt.

Alaska, Sitka—APARTMENT—John and Martha Cushing and Dr. W. C. Charteris, Sitka, 37 unit Cathedral Apartments, day labor. **$439,500.** CD 2/2.

N. S., Antigonish—HOSPITAL—St. Martha's Hospital, Antigonish, two wings 48x53 ft., 5 story, structural steel, brick, stone St. Martha's Hospital exten., to T. C. Gorman (Nova Scotia) Ltd., 123 Roy Bldg., Halifax. Approx. **$700,000.** CD 10/24/45.

▲ **Ont., Scarborough**—APARTMENT—Monarch Constr. & Realty Co. Ltd., Confederation Bldg., Toronto, 26 apartment, Eglinton Ave., **$1,756,080;** 700 dwellings, Dawes Rd. and Eglington Ave., **$5,755,000.** Owner builds.

▲ **Ont., Toronto**—DWELLINGS—Monarch Constr. & Realty Co., Ltd., Confederation Life Bldg., Toronto, 400 dwellings on west side of Bathurst St. on Dominion nursery property, **$3,460,000;** 20 apartments on west side of Bathurst St. north of Wilson Ave., **$1,349,220.** Owner builds.

▲ **Que., Montreal**—HOUSING—D. & N. Holdings, Ltd., 1178 Phillips Pl., one hundred 30x33 ft., concrete, brick duplexes, Esplanade Ave., to S. A. Cubois, 4335 Lacombe Ave., **$1,300,000.** Thibodeau & Thibodeau, 1178 Phillips Pl., archts.

Que., Montreal—DWELLINGS—Owner, c/o S. Gerson, archt., 1178 Phillip Pl., 100 one story, 24x27 ft., concrete, brick dwellings, to M. Janin & Co., Ltd., 2165 Clifton Ave., **$600,000.** CD 2/25.

Que., Montreal—COTTAGES—Victoria Constr. Co., 2300 Florian St., 42 cottages and duplexes, MacDonald Ave. Owner builds. **$400,000.**

Que., Three Rivers—APARTMENT—Frank Spenard, 936 Notre Dame St., 2 story, bsmnt., 90x155 ft., U-shaped 24 unit apartment, Franchenelle and Bourg Joly Sts., to Geo. Lambert Enregistre, 1000 Blvd. Normand, Approx. **$400,000.** CD 4/5/49.

INDUSTRIAL BUILDINGS

BIDS ASKED

Conn., Norwalk—FACTORY—B.A. 3/29—Perkin Elmer Corp., 535 Hope St., Stamford, 1 story, 40,000 sq. ft. factory, N. Main St. $200,000. Extended date. CD 2/28.

Conn., Danielson—WAREHOUSE—B.A. 3/31—United Co-operative Farmers, Inc., 315 Broad St., Fitchburg, 1 story, 75x141 ft., concrete, steel warehouse, $68,000. Charles W. Dingman, 34 Maple St., Palmer, Mass., archt.

Ga., Atlanta—TERMINAL—B.A. 3/31—Terminal Transport Co., Ind., c/o Greer, Holmquist & Chambers, archts., Stallings Bldg., Birmingham, Ala., motor freight terminal, $225,000. Plans deposit $25.

▲ **Tex., Snyder**—GASOLINE PLANT—Bids Asked—Lion Oil Co., Snyder, natural gasoline plant. $2,750,000. CD 3/3.

SOON LETS CONTRACT

N. Y., Brooklyn—STOCK HOUSE—Joseph Schlitz Brewing Co., 193 Melrose St., soon lets contract stock house $945,000. Harley Ellington & Day, Inc., 153 East Elizabeth St., Detroit, Mich., engr., CD 12/21.

Tex., Midland—SHOP, etc.—Miles Hall Buick Co., 1010 W. Tennessee St., soon lets contract auto shop, service sales. $90,000. Extended date. Chas. H. Neuhardt, 223 S. Big Spring St., archt. CD 2/15.

Wash., Cashmere—PLANT—Cashmere Fruit Growers Union, Cashmere, soon lets contract 240x430 ft. fruit packing and refrigerated storage plant. Approx. $68,000. Knowles & Callender Eng. Co., Jones Bldg., Seattle, arch's. CD 2/24.

W. Va., Wheeling—CHANGE HOUSE, etc.—Valley Camp Coal Co., Western Reserve Bldg., Cleveland, O., soon lets contract change and wash house. $65,000. Plans deposit $10. Dalton & Dalton, Old Arcade, Cleveland, O., archts.

LOW BIDDERS

▲ **La., New Orleans**—SERVICE, etc.—Krauss Co., Ltd., 1201 Canal St., Mar. 9, 6 story, 128x200 ft. service and 6 story, 33x128 ft. department store addn., from R. P. Farnsworth Co., Inc., 1515 S. Salcedo St., **$1,371,000.** CD 3/8.

CONTRACTS AWARDED

Fla., Miami—PLANT, etc.—McArthur Jersey Dairy Farm, c/o Robert Fitch Smith, archt., 201 Shoreland Bldg., Dairy plant and garage, to Perry E. Willits, Inc., 882 N. E. 79 St., Approx. **$500,000.** CD 8/10/49, under LB.

Ga., Waynesboro—PLANT—Cotton Producers Assn., c/o D. W. Brooks, Waynesboro, grain elevator and seed drying plant, to Thomas L. Burrell, Inc., c/o owner, Approx. **$300,000.**

▲ **Ill., Decatur**—GRAIN ELEVATOR—Spencer, Kellog & Sons, Inc., Decatur, 100 ft. high 2½ million bu. soybean storage elevator, to James Stewart Co., Inc., 231 S. La Salle St., Chicago. Approx. **$2,000,000.**

N. Y., Ridgewood—FACTORY—Eastern Tube & Tool Co., 594 Johnson Ave., Brooklyn, Zone 6, 1 story, 227x253 ft. factory, Onderdonk Ave., east of Metropolitan Ave., to H. Rosen, 11-42 46 Rd., Long Island City. **$350,000.** CD 2/17.

▲ **Tex., Laredo**—POWER PLANT—Central Power & Light Co., 120 N. Chaparral St., Corpus Christi, expansion original electric power plant proj., to A. E. Hinman, Wilson Bldg., Corpus Christi, and Austin Building Co., 1000 Singleton St., Dallas. **$1,500,000.**

Wis., Green Bay—MILL—Northern Paper Mills, Green Bay, general contract 2 and 3 story, 1004x68 ft., concrete, steel, brick paper mill addn., day labor, **$500,000.**

Ont., Brantford—PLANT—Brantford Expositor, Dalhousie and Queen Sts., 2 story, bsmnt., 60x120 ft. newspaper plant adn. to Cromer Constr. Co., Ltd., 448 Colborne St., Approx. **$300,000.** L. H. Kemp, 37 Dalhousie St., and F. C. Bodley, 88 Nelson Sts., archts.

Ont., Hamilton—PLANT, etc.—Life Savers Ltd., Sanford Ave. S., 2 story, bsmnt., T-shaped 200x50 ft., 50 ft. square rein. con., frame plant and office, Burris and Cumberland Sts., to W. H. Cooper Constr. Co., Ltd., Hunter and Hughson Sts., Hamilton. Approx. **$400,000.** Bids 3/8. CD 2/28.

▲ **Ont., Toronto**—PLANT—Canadian S-K-F Co., Ltd., 1057 Bay St., superstructure 3 story, 190x340 ft., structural steel, brick for plant and 2 story for office, Birchmount Ave., to Pigott Constr. Co., Ltd., 1250 Bay St., Approx. **$2,000,000.** Bids 2/6. CD 2/15, under LB.

Ont., Toronto—WAREHOUSE—Standard Sanitary & Dominion Radiator, Ltd., 1201 Dupont St., 2 new sections 6 story, bsmnt., 32x12 ft. and single story, 25x150 ft., rein. con., warehouse exten., Dupont St. and Lansdowne Ave., to A. W. Robertson Ltd., 57 Bloor St. W., Approx. **$700,000.** Bids 3/6. CD 2/27.

Que., Montreal—WAREHOUSE—Woodhouse & Co., Ltd., 105 W. St. Catherine St., 375x375 ft., rein. con., structural steel, glass warehouse, to Atlas Constr. Co., Ltd., 4781 W. St. Catherine St., **$600,000.** Wood & Langston, 4444 W. Sherbrooke St., archts.

UNCLASSIFIED

BIDS ASKED

Minnesota—RURAL DISTRIBUTION LINES—B. A. 3/29—Lyon-Lincoln Electric Co-operative, Inc., Tyler, about 130 mi. rural distr. lines, Lyon, Lincoln and Yellow Medicine Counties. Approx. $120,000. Plans deposit $10. United Eng. Service, 600 Kasota Bldg., Minneapolis, engr. CD 12/1.

N. Y., New York—TEST BORINGS—B. A. 3/29—New York City Housing Auth., 63 Park Row, Zone 7, test borings for throggs' Neck Houses (Proj. No. 5-51) in area bounded by E. 177 St., Dewey, Balcom, Phillip and Calhoun Aves.

† **Va., Norfolk**—FLOODLIGHTING—B.A. 3/29—Pub. Wks. Office, Headquarters, Fifth Naval Dist., U. S. Naval Base, Zone 11, floodlighting softball fields at U. S. Naval Base (Receiving Station). Spec. No. 23548. Plans deposit $10.

Missouri—RURAL DISTRIBUTION LINES—B.A. 3/30—Citizens Electric Corp., Theo. A. Carron, pres., Ste. Genevieve, labor only, about 186.07 mi. rural distr. lines, Sect. D, 117.28 mi., Sect. F and 187.92 mi., Sect. 9, total 491.27 mi. 7.2 kv. single phase rural distr. lines, Ste. Genevieve, Perry and Cape Girardeau Counties, Missouri 58D, 58F and 58G. Bids 2/2 rejected. Drazen & Assoc., 8135 Forsyth Blvd., St. Louis, Zone 24, engrs. CD 2/13.

† **Neb., Maxwell**—CEMETERY FACILITIES—B.A. 3/30—U. S. Eng., 1709 Jackson St., Omaha, Zone 2, construct addnl. area facilities at Fort McPherson National Cemetery. Serial No. 25-066-50-4. CD 3/6.

† **Wash., Richland**—UTILITY SYSTEMS, etc.—B.A. 3/30—U. S. Eng., 19 E. Poplar St., Walla Walla,

utility sys. and irrigation piling sys., CIVENG-45-164-50-197.

Wash., Omak—FISH HATCHERY—B.A. 3/31—State Dpt. Game, 509 Fairview Ave., N. Seattle, fish hatchery with 92-trough hatchery bldg., residence and garage, pumphouse, 4 concrete rearing ponds, water distr. sys., drainage, driveways, etc., $70,000. Plans deposit $10.

Mississippi—RURAL DISTRIBUTION LINES—B.A. About 4/1—East Mississippi Power Assn., Meridian, 400 mi. rural distr. lines in Lauderdale, Clarke, Kemper and Winston Counties.

La., Baton Rouge—FIRE ALARM SYSTEM—B.A. 4/4—City, Class A fire alarm system. Plans deposit $50. Porter, Barry & Switzer, 545 Lafayette St., engrs. CD 10/4.

SOON LETS CONTRACT

Calif., Oakland—SWIMMING POOL, etc.—Claremont Country Club, Broadway and Clifton Sts., soon lets contract swimming pool with lounge area dressing rooms, etc. Approx. $50,000. Clarence W. Mayhew, 251 Post St., San Francisco, archt.

Tenn., Hampton—BOAT HOUSES, etc.—Watauga Lakeshores, Inc., c/o Goforth Eng. Co., engr., Erwin, soon lets contract lakeside development, incl. boat houses, etc. CD 3/3.

Tex., San Angelo—RAILWAY TRACKS—Gulf, Colorado & Santa Fe Ry. Co., W. T. Donoho, acting ch. engr., Rosenberg and Grand Sts., Galveston, soon lets contract relocating railway tracks for 9¼ mi. due to dam and reservoir. $100,000. Plans deposit $40.

LOW BIDDERS

† **Calif., Sacramento**—SPRINKLER SYSTEM—U. S. Eng., 180 New Montgomery St., San Francisco, Mar. 9, automatic sprinkler sys. for Repair Docks 1, 2 and 3, Bldg. 51, Spec 04-204-50-107, from Grinnell Co., 601 Brannan St., San Francisco. **$125,947.**

Fla., Hialeah—GRANDSTAND ALTERATIONS, etc.—Hialeah Race Course, Inc., c/o Lester W. Geisler, archt., Kissimmee, Mar. 8, grandstand alterations, etc., from Witters Constr. Co., 1297 S.E. 10 Court. **$115,416.**

Ia., Des Moines—PARKING BLDG.—City, general contract, heating and plumbing park bldg., 4 and Locust Sts., from Kucharo Constr. Co., 225 Jewett Bldg. **$315,260.** CD 1/20.

† **Nebraska**—TRANSMISSION LINE—Bureau Reclamation, Dpt. Interior, Casper, Wyo., 52 mi. Alliance-Chadron 115-kv. transmission line, Missouri River Basin Proj., Transmission Div. Spec. 2901, from I. O. Teigen Constr. Co., 1954 University Ave., St. Paul, Minn. **$312,439.** Est. $370,571. CD 1/31.

South Dakota—RURAL DISTRIBUTION LINES—Upper Grand River Electric Assn., Bison, Feb. 23, 233 mi. rural distr. lines, Perkins Co., from Zontelli Constr. Co., Ironton, Minn., **$232,038.** CD 2/8.

Tenn., Memphis—UNDERGOUND CABLE SYSTEM—City, 115,000 volt underground cable sys. to connect 3 and Front Sts. with Northgate Station, from Harrison-Wright Co., Inc., 116 W. 3 St., Charlotte, N. C. **$602,497.**

Tex., Houston—PARK—City, City Hall, 900 Brazos St., Mar. 9, parking, incl. concrete swimming pool and bathhouse, 76 St. and Avenue J, from Linbeck Constr. Co., 1532 Peden St. **$148,781.** Est. $165,000. R. G. Jackson & Frank C. Dill, 4511 Kyle St., archts.

Tex., Houston—POOL—City, Hugo Kuehne, dir. Parks, City Hall, 900 Brazos St., Mar. 8, rein.-con. Sea Lion Pool, concrete quarters, moats, etc., from Fisher Constr. Co., 4711 Greeley St., **$216,700.** Est. $75,000. Hare & Hare, 114 W. 10 St., Kansas City, Mo., landscape archts.

CONTRACTS AWARDED

Fla., Jacksonville Beach—MOTOR COURTS—Mr. and Mrs. Francis H. Birch, 2026 Camden Ave., Jacksonville, Zone 7, two motor courts at Eight Ave. and Third St., to Barkhuider & Inman, Jacksonville Beach. **$102,000.** Awarded 3/6.

Oregon—RURAL DISTRIBUTION LINES—Benton-Lincoln Electric Cooperative, Inc., 561 Van Buren St., Corvallis, 64.62 mi. 7.2/12.5 kv. rural distr. lines, Lane and Benton Counties, to Del Monte Electric Co., Box 145, Elmhurst, Oakland, Calif., **$171,529;** 43.9 mi. 69 kv. rural distr. lines, Lane and Benton Counties, to Walton Brown, 236 State St., Salem, **$159,578.** Bids 3/7. CD 2/20.

Oregon—RURAL DISTRIBUTION LINES—Coos Electric Co-operative, Coquille, construct 32.7 mi. 69 kv. rural distr. lines, Coos Co., to Del Monte Electric Co., Box 145, Elmhurst, Oakland, Calif., **$166,889.** Bids 3/9. CD 2/16.

Tex., Houston—WHARF—Harris Co. Navigation Dist., c/o Port Comm., Wharf 3, 129x600 ft. open type, steel, rein.-con. wharf, to Farnsworth & Chambers Co., Inc., Box 74. **$811,805.** Est. $1,000,000. Bids 3/2, awarded 3/10. CD 3/8, under LB.

Tex., San Antonio—LIGHTING SYSTEM—City Public Service Bd., 201 N. St. Marys St., underground rehabilitation and exter. lighting sys., approx. **$125,000;** street lighting throughout the city, for Unit 8, **$150,000,** force account. CD 1/19.

▲ **Wyoming and Montana**—GAS PIPE LINE—Montana-Dakota Utilities Co., 831 2 Ave. S., Minneapolis, Minn., 340 mi. 12-in. gas pipe line from gas field near Worland, Wyo., to company's Cabin Creek compressor plant, near Baker, Mont., to R. A. Conyes Constr. Corp., 2844 San Pablo Ave., San Pablo, Calif. Approx. **$8,000,000.** CD 10/4.

Ont., Toronto—LANDSCAPING—Municipality, landscaping University Ave., sidewalks of flagstone, planting trees, sodding, etc., day labor, **$250,000.** Murray Stewart, city engr. CD 7/5/49.

Proposal Advertisements see pp. 337 to 339

OFFICIAL PROPOSALS

RATE: THE RATE FOR OFFICIAL PROPOSAL ADVERTISING IS $1.00 PER LINE (OR FRACTION) PER INSERTION

COPY RECEIVED UP TO 10.00 A. M. FRIDAY FOR ISSUE OUT NEXT THURSDAY SUBJECT TO SPACE OPEN FOR LAST MINUTE ADS

SEND COPY TO OFFICIAL PROPOSAL DIVISION, ENGINEERING NEWS-RECORD, 330 W. 42ND ST., NEW YORK 18, N. Y.

Bids: April 6, 1950 (647)

Paving of Road

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 35, SECTION 40C

Paving on Route 35, Section 40C, from School House Road to Riverview Drive, in the Borough of Brielle, Monmouth County, Federal Project No. U-59(6). Length 0.538 miles.

Estimated:

Roadway Items

12,300 cu. yds. Roadway Excavation—Earth
151,600 cu. yds. Borrow Excavation
12,000 cu. yds. Subbase
225—Trees
973—Shrubs
2,394—Vines
32,600 sq. yds. 4" Mod. Pen. Mac. Inter. Course
3,700 tons Pavement, Type MA-BC-1

Bridge Items

3,210 lin. ft. Treated Timber Piles
1,639 cu. yds. Concrete in Structures
469,000 lbs. Structural Steel
36,000 lbs. Rein. Steel in Structures

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, N. J., on Thursday, April 6, 1950, at eleven o'clock (11.00 A.M. EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by Section 1, Public Laws 834, 80th Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 17-19 Main Street, Asbury Park, N. J. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $.75 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

Bids: April 3, 1950 (642)

General Improvements

CORPORATION NOTICE
CITY OF YONKERS
PROPOSALS FOR REGULATING, GRADING AND OTHERWISE IMPROVING PARKING AREA AND ACCESS STREETS IN THAT SECTION OF THE CITY OF YONKERS, KNOWN AS CHICKEN ISLAND AS PER PLANS AND SPECIFICATIONS.

Office of the
Board of Contract and Supply
Yonkers, New York, March 15, 1950.

Pursuant to Special Ordinances Nos. 202, 1946, 121, 1947, 162, 1949, 217, 1949 and Resolution No. 333, 1949, sealed proposals will be received at the Office of the Secretary of the Board of Contract and Supply, Room No. 318 City Hall, Yonkers, New York, until 2:00 o'clock P.M. (Eastern standard time), Monday, April 3, 1950.

Copies of Information for Bidders, Form of Proposals, Form of Contract, including Plans and Specifications for the aforesaid improvement may be obtained at the Office of the Board of Contract and Supply, and only bids made upon said forms will be accepted. Copies may be obtained upon deposit of $10.00 (cash or certified check) which will be refunded to each bidder who bids, or returns the Plans and Specifications unused, within Ten (10) days after the opening of bids.

Dated March 15, 1950

FRANK VAN BLARCON
Secretary of the Board of Contract and Supply

Bids: April 13, 1950 (644)

New York International Airport Utilities and Paving for Permanent Operations Building

THE PORT OF NEW YORK AUTHORITY
CONTRACT NYA-102

Sealed proposals for the utilities and paving for the Permanent Operations Building at the New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, N. Y., until 2:00 P.M., Monday, April 3, 1950, and thereafter in the Auditorium of the Authority at the same address until 2:45 P.M. on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer of the Authority and copies will be furnished upon deposit of $25.00 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman,
Chairman.

New York, March 23, 1950.

U. S. Government

Office of the District Engineer, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota.—Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for Construction of Upper Guide Wall Extension at Lock and Dam No. 6, Mississippi River near Trempealeau, Wisconsin, will be received in this office until 11:00 A.M., C.S.T., 30 March 1950 and then publicly opened. Further information upon application. (631)

(Continued on page 338)

OFFICIAL PROPOSALS

U. S. Government

(Continued from page 337)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. 2948) will be received by Bureau of Reclamation, Casper, Wyoming, April 12, 1950, and then publicly opened for furnishing labor and materials and performing all work for Seminoe Dam tailrace repairs. The work is situated about 37 miles northeast of Sinclair, Wyoming. Principal items are approximately: excavation, 22,000 c.y.; rock fill for power-plant access road, 15,400 c.y.; concrete, 4,000 c.y., furnishing and installing miscellaneous pipe and guardrail; and other work. Time allowed for completion will be 200 days. For particulars, address Bureau of Reclamation, Casper, Wyoming; or Building 1-A, Denver Federal Center, Denver, Colorado.

. MICHAEL W. STRAUS, Commissioner

OFFICIAL PROPOSALS

Bids: April 26, 1950 (639)

Construction of the Mystic Pier No. 1

PORT OF BOSTON AUTHORITY
CONSTRUCTION OF MYSTIC PIER NO. 1
CONTRACT NO. 5

A—NOTICE TO BIDDERS
PORT OF BOSTON AUTHORITY
SEALED BIDS FOR CONTRACT NO. 5
CHARLESTON, MASSACHUSETTS

Sealed Proposals will be received by the Port of Boston Authority at its office, Commonwealth Pier No. 5, Boston, Massachusetts, until 2:00 P. M., Eastern Standard Time on the twenty-sixth (26) day of April, 1950, at which time and place the bids will be opened publicly and will be read aloud.

The Contract Documents, including Specifications and Drawings may be examined at the Port of Boston Authority, Office of the Chief Engineer, Commonwealth Pier No. 5, Boston, Massachusetts, on and after the twentieth (20) day of March, 1950, every weekday except Saturdays and Holidays between the hours of 9:00 A.M. and 4:00 P.M. Contractors desiring to bid on this work may withdraw plans and specifications upon payment of One Hundred Dollars ($100.00) for each set. Deposits will be refunded to Bidders only upon the return of plans and specifications in good condition within ten (10) days after the opening of bids.

Each bid must be accompanied by a certified check in the amount of Fifty Thousand Dollars ($50,000.00). A performance bond in the full amount of the contract will be required of the successful bidder.

Attention of bidders is called to the requirements of Chapter 461, Acts of 1935, as to conditions of employment to be observed and minimum wage rates to be paid under the contract; to General Laws (Ter. Ed) Chapter 149, as amended by Chapter 480, Acts of 1939, and Chapter 699, Acts of 1941, pertaining to subcontractors and fair competition among bidders on construction, reconstruction, alterations, remodeling or repair of certain public buildings also to Chapter 7, Sections 22 and 23A of the General Laws as amended by Chapter 353, Acts of 1933, pertaining to a preference in the purchase of supplies and materials, other considerations being equal, in favor, first, of supplies and materials manufactured and sold within the Commonwealth, and, second, of supplies and materials manufactured and sold elsewhere in the United States.

The right is reserved to waive any informalities in or to reject any or all bids. The contract is subject to the approval by the Governor and Council.

PORT OF BOSTON AUTHORITY
By James R. Nolen
Chairman

Bids: April 6, 1950 (646)

Paving Bridge Approaches

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON
READVERTISEMENT

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE S49, SECTION 5B
GRASSY SOUND BRIDGE APPROACHES —PAVING

Paving on Route S49, Section 5B, Grassy Sound Bridge Approaches, Lower Township and City of Wildwood, Cape May County. Length 0.688 miles.

Estimated:
4,200 cu. yds. Roadway Excavation—Earth
5,100 cu. yds. Borrow Excavation
18,000 sq. yds. 12" Gravel Base Course
18,000 sq. yds. 4" Modified Pen. Mac., Inter. Course
2,555 tons Pavement, Type MA-BC-1 (Hot Mix) or Pavement, Type A or Type T (Cold Mix)

Bids for the above will be received at the office of the State Highway Department, Room 102, State House Annex, Trenton, New Jersey, on Thursday, April 6, 1950, at eleven o'clock (11:00 A.M.—EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: Spencer Miller, Jr.
State Highway Commissioner

Bids: April 4, 1950 (645)

New Jersey Turnpike Authority

Sealed proposals will be received by the New Jersey Turnpike Authority for:

CONTRACT NO. 15

The work to be performed under this Contract involves the construction of the substructures and superstructures of the Morses Creek Bridge and the Railroad Avenue Viaduct and other incidental work which will form part of the New Jersey Turnpike through the lands of the Esso Standard Oil Company, Bayway Refinery, in the City of Linden, Union County, New Jersey.

Principal items of work include:
Fill, 11,000 Cu. Yds.; Open Foundation Excavation, 11,100 Cu. Yds.; Untreated Timber Piles, 38,000 Lin. Ft.; Precast Concrete Piles, 4,160 Lin. Ft.; Concrete in Abutments, Wingwalls, Piers and Bents, 8,500 Cu. Yds.; Concrete in Deck Slabs, Safety Walks and Parapets, 3,930 Reinforcement Steel 1,600,000 Lbs.; Metal Railings, 2,380 Lin. Ft., Protection of Railroad Traffic Lump Sum.

Proposals will be received at the office of the New Jersey Turnpike Authority, 65 Prospect Street, Trenton 8, New Jersey, until 10:30 o'clock on the morning of April 4, 1950, and thereafter in the Veterans Room of the War Memorial Building, Memorial Drive at Willow Street, Trenton, New Jersey until 11:00 A.M. on the same date, at which latter time and place said proposals will be publicly opened and read.

The receipt and opening of proposals is subject to proper prequalification of the bidder in accordance with the regulations adopted by the New Jersey Turnpike Authority. Bidders must also submit with their proposal a revised financial statement and a statement of plan and equipment.

Contract documents may be seen, and may be inspected by prospective bidders during office hours, after March 14, 1950, at the office of the New Jersey Turnpike Authority, 65 Prospect Street, Trenton 8, New Jersey and at the office of the Engineers, Ammann & Whitney, 210 Market Street, Newark, New Jersey, or 76 Ninth Avenue, New York, New York.

Contract Documents will be furnished for $5.00 for each set, upon application to the Authority. The payment will not be refunded and contract documents are not required to be returned.

Proposals must be made upon the standard proposal forms in the manner designated in the Standard Specifications for Construction of the New Jersey Turnpike and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and the number of the contract on the outside, and must be accompanied by a *certified check* drawn to the order of the New Jersey Turnpike Authority *and a proposal bond, each for not less than five (5) percent of the amount of proposal,* but not less than $500.00 nor more than $200,000.00 and must be delivered with proposal on or before the hour named. Copies of the proposal form to be used for submitting proposals, of the form for proposal bond, of the form to be used for financial statement and plan and equipment statement to be submitted with proposal, and of special addressed envelope will be furnished on application. Proposals not enclosed in sealed special envelopes will be considered informal and will not be opened.

The Contracts will be awarded or proposals rejected within thirty (30) days from the date of opening proposals. The right is reserved to reject any or all proposals.

NEW JERSEY TURNPIKE AUTHORITY
March 14, 1950
PAUL L. TROAST
Chairman

(Continued on page 339)

CONTRACTORS
Watch this Section
for New Projects

Publish your announcement thru the "Proposals Section" of Engineering News-Record and get their bids.

U. S. Government

(Continued from page 338)

BIDS FOR EREC[illegible]ON OF DRAGLINE GRADER MACHINES—Memphis District, Corps of Engineers, U. S. Army, P. O. Box 97, Memphis 1, Tenn. Sealed bids will be received here until 2:00 p.m., C.S.T., April 13, 1950, and then publicly opened, for the erection of two dragline grader machines on two steel barges. Information on request. (640)

OFFICIAL PROPOSALS

Bids: April 4, 1950 (638)

Construction of Grading Drainage & Paving

PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 A.M. (Eastern Standard Time), the 4th day of April 1950, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and immediately publicly opened and read aloud, for the following contract:

For the construction of structures and the grading, drainage and paving of Turnpike Section 31C, part of the Western Pennsylvania Turnpike Extension in Plum and Patton Townships, Allegheny County, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point approximately 1,356 feet West of the Unity-Trestle Road in Plum Township at Turnpike Station 1239+03.50, Allegheny County, thence in an Easterly direction 15,460 feet to a point approximately 421 feet East of the Monroeville-Trestle Road in Patton Township, at Turnpike Station 1395+00, Allegheny County, a distance of approximately 2.93 miles.

The approximate quantities of the principal items are as follows:

Class 1 Excavation, 907,000 cubic yards; Class 2 Excavation, 14,500 cubic yards; Borrow Excavation, 45,600 cubic yards; Reinforced Concrete Pavement, 83,000 square yards; Class A Concrete, 830 cubic yards; Class B Concrete, 5,650 cubic yards; Steel Reinforcing Bars, 631,700 pounds; Fabricated Structural Steel, 1,143,000 pounds.

Copies of plans, specifications, and other contract documents, including cross-sections are on file and open to public inspection at the offices of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania, on 20 March 1950. Plans specifications, cross-sections, and other contract documents will not be available before this date for inspection or for mailing to prospective bidders. Copies of specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of Five ($5.00) dollars per copy. Copies of cross-sections may be purchased from the Pennsylvania Turnpike Commission for the sum of fifty ($50.00) dollars per set, for each section.

Plans and contract documents, for this section, exclusive of cross-sections and specifications may be obtained from the Commission upon deposit of ten ($10.00) dollars for each set, such deposits to be refunded in full to any actual bidder upon return of such documents in good condition within five (5) days after the date of the opening of the bids. Refund will be made for all plans, contract documents, and cross-sections returned, if the project is withdrawn from letting by the Pennsylvania Turnpike Commission. Remittances are payable to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications, contract documents, and cross-sections.

The character and amount of bid security to be furnished by the bidder is stated in the "Instructions to Bidders."

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer

Harrisburg, Pennsylvania
March 13, 1950

OFFICIAL PROPOSALS

Bids: April 13, 1950 (641)

Atlantic Beach Bridge

Sealed bids will be received by the Nassau County Bridge Authority in the chambers of the Board of Supervisors, First Floor, Old County Court House, Franklin Avenue, Mineola, Nassau County, New York, until 10:30 A. M. on April 13th, 1950, when they will be publicly opened and read aloud, and the Contract awarded as soon as practicable thereafter, for the construction of the Atlantic Beach Bridge over Reynolds Channel between Lawrence and Atlantic Beach, Nassau County, New York.

The work will be performed under a single, unit-price contract, except for certain minor features which will be let under separate contracts. Attention of bidders is particularly called to the requirements of the Labor Law as to conditions of employment to be observed and the minimum wage rates to be paid under the contract, and to the fact that a performance bond will be required.

After the opening of bids and when directed by the Chairman of the Authority, the bidder must submit a sworn statement setting forth such information as the Chairman may require concerning his financial condition, present and proposed plant and equipment, the personnel and qualifications of his working organization, prior experience and performance record.

Proposal for Bids, Bid Agreement, Contractor's Bond, Specifications and the Plans may be examined at the offices of Hardesty & Hanover, Consulting Engineers, 101 Park Avenue, New York, New York, not later than April 10th, 1950, 5:00 P. M., preceding the day for receiving bids, and copies of the same may be obtained there.

A deposit of Fifty ($50.00) Dollars will be required for each copy of the Plans and Contract Documents. Any bidder upon returning to the office of Hardesty & Hanover, Consulting Engineers, 101 Park Avenue, New York, N. Y., such set of Contract Documents and Plans in good condition within thirty (30) days after the awarding of the contracts covered thereby, or the rejection of the bid of such bidder, will be refunded his deposit and any non-bidder upon so returning such set will be refunded Forty ($40.00) Dollars of his deposit.

Each proposal must be accompanied by a security deposit in the amount as fixed in Article 20 of the Agreement, by money or a certified check on a solvent bank or trust company, made payable to the Nassau County Bridge Authority or the bidder, as assurance that the bid is made in good faith (e.g., Nassau County Bridge Authority *or* John Smith, Inc.), or in lieu of such money or certified check, the bidder may furnish with his bid a bond in the amount of such security deposit (the form of which bid bond may be obtained at the offices of Hardesty & Hanover, Consulting Engineers), duly executed by the bidder as principal and having as surety thereon a surety company approved by the Nassau County Bridge Authority.

The Nassau County Bridge Authority reserves the right to waive any informalities in or to reject any or all bids, and to accept the bid which it deems most favorable to the interest of the Authority after all bids have been examined and canvassed.

NASSAU COUNTY BRIDGE AUTHORITY
By William F. Ploch
Secretary

Dated: At Mineola, L. I., N. Y.
March 14th, 1950

Read the Official
Proposal Columns of
ENGINEERING NEWS-RECORD
This Week and Every Week

Bids: March 29, 1950 (629)

State Road Work

NOTICE TO CONTRACTORS. STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Chapter 63 Laws of 1936, as amended, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on March 29, 1950 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract containing 1 to 15 sheets is $5.00; 16 to 30 sheets, $10.00; over 30 sheets, $20.00. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT NO. 4				
		A. R. Mulligan, Dist. Engr., Barge Canal Terminal, Rochester, N. Y.				
Monroe	LOSP 50-1P	Lake Ontario State Parkway, Sect A	4.36	8" Cem. Conc. Pavt. 2 at 24' Wide, Altering Existing 36'4" Rigid Frame	$58,000 Plans $20	$1,061,000
		DISTRICT NO. 6				
		H. F. Rhumm, Dist. Engr., 30 West Main St., Hornell, N. Y.				
Steuben	PSC 9418	Elimination of Grade Crossings of the Erie R. R. and The D. L. & W. R. R., with various Streets and the N. Y. C. R. R. in the City of Corning	8.20	Relocating R. R. Tracks Paving Streets With Cement Conc. Pavt. and Asphalt Conc. Opt., Including 20 R. R. Bridge Structures 3 Pedestrian Subways, 2 Highway Bridge Structures and Incidental Drainage and Misc. Work	$500,000 Plans $100	$8,707,155
		DISTRICT NO. 8				
		J. S. Bixby, Dist. Engr., Pleasant Valley Rd., Poughkeepsie, N. Y.				
Columbia	RC50-8	9087 Hudson-Brick Tavern Ghent	0.44	8" Cement Concrete Pavt. 24' Wide Alpha I-Beam 5 Spans 50'-3" Each. Alpha = $406.	$13,000 Plans $5	$238,000
Westchester	SH 50-2	Port Chester Village Hillside Ave. & Connection to S. H. 5662	0.10	Asph. Conc. Opt. on Conc. Foundation	$1,600 Plans $5	$30,000

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • **OPPORTUNITIES** • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
(Not available for equipment advertising)
$1.20 cents a line, minimum 4 lines. To figure advance payment count 5 average words as a line.
INDIVIDUAL EMPLOYMENT WANTED undisplayed advertising rate is one-half of above rate, payable in advance.
PROPOSALS, $1.00 a line an insertion.

INFORMATION.
BOX NUMBERS care publication New York, Chicago or San Francisco offices count as 1 line additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:
The advertising rate is $11.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured 7/8 inch vertically on one column, 3 columns—30 inches —to a page. E.N.R.

NEW ADVERTISEMENTS received by March 27th will appear in April 6th issue subject to limitation of space available.

SALES MANAGER

Internationally known engineering and building firm specializing in Industrial Plant work, with main offices in the Midwest, offers a splendid opportunity for an exceptionally experienced Sales Executive.

The applicant chosen will coordinate all sales efforts for the company. Duties will involve development of new prospects and maintenance of superior sales relations with customers.

Applicants must be a proven organizer, administrator and should have design and construction experience on industrial plants as well as sales experience.

If you have qualifications fitting these requirements please mail a complete confidential resume, stating your past experience, education and salary requirements.

P-2470, Engineering News Record
330 W. 42nd St., New York 18, N. Y.

SALESMAN

Need top flight shovel and crane salesman who can produce in Metropolitan New York area. Will sell one of leading lines. Applicant must state experience, record, age and remuneration expected, in detailed resume for consideration. Our Sales Force has been notified of this ad. All replies held in strict confidence.

SW-2378, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

CENTRIFUGAL PUMP DESIGNER

Manufacturer of nationally accepted line of centrifugal pumping machinery requires the services of an experienced pump designer. Thorough knowledge of hydraulics essential. Midwestern location. In reply submit full particulars: age, education, experience and salary required.

P-2455, Engineering News Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED SUPERINTENDENT

for sewage and waterworks by old and well-established firm, operating principally in Indiana, but planning expansion. Write only for interview. State age, experience, qualifications, reference and salary expected.

P-2548, Engineering News Record
520 N. Michigan Ave., Chicago 11, Ill.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

CIVIL SERVICE

SEWER DESIGN Engineers. At least four years of graduate civil engineering experience with experience on municipal sewer systems preferred. For work on extensive sewer survey and design projects with the City of Dayton. Registered in the State of Ohio or eligible for such registration. Starting salary $3600 to $5000, depending on qualifications. Apply with full details and photograph to Personnel Supervisor, Municipal Building, Dayton, Ohio.

MECHANICAL ENGINEER: To design heating, plumbing, and electrical systems for general construction work under municipal capital improvement program. Salary $4104-$4920. For details, write to: Personnel Director, City of Hartford, 550 Main St., Hartford, Conn. (Current Vacancy).

STRUCTURAL ENGINEER: To design structural systems for general construction work; prepares plans and specifications for construction contracts, investigates existing structures and recommends required changes. Salary $4104-$4920. For details, write to: Personnel Director, City of Hartford, 550 Main St., Hartford, Conn. (Two current vacancies).

PHYSICAL TESTING Engineer $481 Requires Valid Calif. C.E. License or Eligibility and 5 yrs. Highway Eng. Exper. in Responsible Testing or Research on Construction Material. Write by April 8, Recruitment Section, Dep't A., 1015 L Street, Sacramento, Calif.

POSITIONS VACANT

CIVIL ENGINEER wanted for a responsible permanent position with a large public utility located in eastern Pennsylvania. Must have a broad experience, a substantial portion of which has been in hydraulics. The position presents an excellent opportunity to the right man. Apply by letter stating age, education, detailed experience and salary requirements. P-2480, Engineering News-Record.

(Continued on page 357)

WANTED
BRIDGE DESIGNERS,
DESIGNER DRAFTSMEN, RESIDENT
HIGHWAY ENGINEERS, SOILS ENGINEER

Experienced men wanted. State qualifications, age, salary and date available in first letter. Construction period, 24 months. Location, Eastern or Western Pennsylvania.

P-2412, Engineering News Record
330 West 42nd St., New York 18, N. Y.

STRUCTURAL STEEL ESTIMATOR

Well known New England fabricating company has an exceptional opening for young experienced structural steel estimator. A real opportunity exists for a man with estimating and sales ability. Give in detail experience, education, etc. References will be required. Replies held strictly confidential.

P-6047, Engineering News Record
330 West 42nd St., New York 18, N. Y.

TECHNICAL SALES REPRESENTATIVE

Large Midwest marketer of asphalt desires technical sales representative under 40, preferably 25-35, with engineering education and experience in application of asphalt for industrial uses as well as road building. State qualifications and starting salary in reply.

P-6061, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

CONTRACT BOND UNDERWRITER

WANTED
by leading
casualty insurance company

Excellent opportunity for a man with 5 to 10 years experience in surety bond underwriting having a thorough understanding of construction work and financial statements. Inquiries will be kept confidential. Your letter stating qualifications and experience should be addressed:

c/o **ECKERT, PETERSON & LEEMING**
Field Bldg.
135 S. LaSalle St. Chicago 3, Ill.

COST ENGINEER

Responsible position available in Midwest Office of nationally known engineering and building firm for Cost Engineer with several years field experience and actual knowledge of current construction costs for all types building and industrial process work. Good salary and opportunity for the qualified applicant.

Send detailed summary of experience and education together with statement regarding salary requirement and date available. All replies strictly confidential.

P-2471, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

WANTED
CONSTRUCTION SUPERINTENDENT

Old firm in Virginia desires top flight man for construction of Sewer Disposal Plant. Must be able to lay out work, supervise construction and run the job. Salary in keeping with ability. Give reference and experience record in first letter.

P6011, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

ESTIMATOR Wanted

Experienced in heavy Grading, Paving, Sewers and Bridges. Splendid opportunity with growing concern. Location Long Island, New York. State age, experience, salary, and full particulars.

P 6041, Engineering News Record
330 W. 42nd St., New York 18, N. Y.

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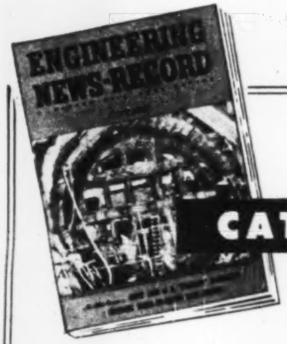

SEARCHLIGHT SECTION

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CONSTRUCTION EQUIPMENT MATERIALS & SUPPLIES

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20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
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1—Plymouth 44-ton Diesel-Electric #4347. New June, 1942.
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1—American 70 ton Stiff Leg—135' boom—complete with American 250 H.P. 3 Drum Gas Hoist with Swinger. NEW.
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Marion 1-yd. diesel powered heavy duty truck crane on heavily reinforced Mack.

Lorain 41 heavy duty ¾-yd. shovel-crane. New 1949. Wt. 45,800 lbs.

Lorain 40A ¾-yd. shovel-clam, 30" cats.

Lorain 40 truck crane, Waukesha engine, mounted on Mack chassis.

P&H Model 100 ⅜-yd. shovel.

SHOVEL & CRANE ATTACHMENTS

Lorain 75 shovel attachment.
Chain crowd L-40-41 shovel attachment.
P&H 203 shovel attachment.
Chain crowd Lorain 30A shovel attachment.
Lorain 40 Hi-Lift shovel attachment.
Bucyrus-Erie 30B tunnel front attachment.
Koehring 301 dragline fairlead.

Backhoe Buckets & Attachments

¾-yd Lorain, 40, LBS #6105. 44" cutting width, teeth, sheave.

27" outside width drop bottom type LBS #1033, good condition.

26" outside width solid bottom type LBS #4377, good condition.

¾-yd Amsco 40" cutting width, LBS #8101.

Lorain 30 hoe attachment.

NEW TAGLINES

McCaffrey Model 648 for 1¼ to 2-yd crane.
McCaffrey Model 636 for ¾-yd to 1-yd crane.

SHOVEL DIPPERS

Lorain 41, ¾-yd, LBS #7433, new condition.

New Lima 1-yd, Amsco, LBS #2295.

Bucyrus-Erie 1¼-yd gas air, LBS #3782, fair.

Lorain 75 manganese 1¼-yd, LBS #7233, teeth and bail.

Lorain 75B, 1¼-yd extended lip, 1¾-yd LBS #2260.

Pettibone-Mulliken 2-yd Lorain 82 or 820, manganese, LBS #5361.

Pettibone-Mulliken 2-yd for 3500 Manitowac LBS #5763.

CLAM—DRAG—SCRAPER BUCKETS

AIR COMPRESSORS

Worthington two-stage, water-cooled, vertical 250#, 60 CFM, new condition.
Ingersoll-Rand 105 cubic foot, Waukesha gasoline power, on two rubber tires.
Gardner-Denver 105 cubic foot with air receiver, hose reel, driven by power take-off and mounted on 1941 Ford.
Gardner-Denver air-cooled 105 cubic foot with air receiver, V-belt drive from power take-off and mounted on 1942 Ford chassis with Wood two-yard dump body.
LeRoi 2-stage 105 cubic foot air-cooled, skid mounted, built-in tool boxes, hose reels and hose.
Gardner-Denver two-stage 160 cubic foot skid mounted.
Schramm 210 cubic foot with International UD14 diesel.
Worthington 210 cubic foot, two-stage, air-cooled, on steel wheels with Hercules diesel.
Chicago Pneumatic 210 cubic foot, two-stage, air-cooled, Caterpillar diesel on four rubber tired wheels.
Gardner-Denver 315 cubic foot two-stage, skid mounted, Murphy four-cylinder diesel.
Pennsylvania 12" x 10" class 3A single cylinder, 355 cubic foot P.D., flat belt driven 50 HP slip ring motor.
New Gardner-Denver 500 cubic foot two-stage water-cooled, D13000 Caterpillar diesel on 4 pneumatics. Used 2 months.

QUARRY EQUIPMENT & BINS

New Telsmith 84"x12' super scrubber—Special price.
18 x 36 Farrell deep jaw crusher.
10 x 36 Cedarapids, practically new.
10 x 7 Allis Chal. Blake type jaw crusher.
Cedarapids No. 1 Kubit.
60 ton 2 compartment storage bin with clam shell gates.
New 16 x 16 double clamshell gates.
20" x 6'6" Belt Type Magnetic Separator.

TRUCKS—TRAILERS

1½-ton Ford & Chevrolet.
2½-ton GMC, New and rebuilt.
Sterling COE Model 255GCS tandem drive tractor 9.00x24 tires, 200 HP Cummins supercharged diesel, complete with 40-ton Rogers low bed equipment trailer, 16—7.50x20 tires, airbrakes, outriggers, excellent condition.
2,000 gallon tanks on semi-trailer mounting.
New and rebuilt dump bodies.
6x6 7½-ton Reo

GASOLINE AND DIESEL ENGINES

New JXD Hercules Gasoline.
Buda, Hercules, Hill diesels, rebuilt.
New Murphy 4 and 6 cylinder diesels.
GM 6 and 12 cylinder diesels, practically new.

CONCRETE ROAD BUILDING & MISCELLANEOUS CONCRETE HANDLING EQUIPMENT

Pavers & Mixers

27E Koehring Paver.
Jaeger 3-yd hi-discharge truck mixer.

Concrete Finishers

Jaeger type "L" double screed, 10½'-12½', rebuilt.
Heltzel 10'-12' finisher, rebuilt.
Blaw-Knox gas-electric 10½'-12½', rebuilt.
2 Koehring 10'-12', rebuilt.

Concrete Spreaders

Blaw-Knox type SA 10'-15' spreader, new 1943. New condition.

Concrete Road Forms

830'—Truscon 7"x8" forms, with stakes.
1380'—Heltzel 7"x8" forms, with stakes.
1300'—Blaw-Knox 8"x8" forms, with stakes.
4450'—Heltzel 9"x8" forms, with stakes.
1430'—Heltzel 10"x8" forms, with stakes.
1010'—Blaw-Knox 10"x8" forms, with stakes.

Fine Grade Machines

Flynn surgrader 10'-12', rebuilt.
R.B. Fine Grader for 21' width, rebuilt.

Form Graders—2 of each

Cleveland formgrader, new condition.
Carr formgrader, new 1944, rebuilt.

BELT CONVEYORS

New 18"—24"—30"—36"

- "Sealed-for-life" idlers
- Lattice or channel frame
- Shipment from stock depending on length

GENERATORS & LIGHT PLANTS

1½ KW to 125 KW, alternating and direct current, gasoline and diesel powered.

GRADERS

New Warco D76 tandem driven grader, 12' blade, V-type scarifier, 13.00x24 tires all around, 24,500 lbs., International UD14A diesel engine.
York Corporation Model SR drawn grader with scarifier, 8' blade, rakes, pneumatics, wt. 7,900 lbs.

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FD Cletrac crawler tractor, Buckeye bulldozer & double drum power control unit, DHXB Hercules diesel engine. Rebuilt, immediate delivery.
International TD-9 with Bucyrus-Erie angledozer.
Oliver 70 wheel type with six-cylinder gas engine and Ware front end loader.
Minn-Moline UTI wheel type, gas powered with Lull front end shoveloader.

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- 1—P & H Truck Crane
- 1—General self propelled Crane & Backhoe
- 1—Oliver self propelled crane
- 1—P & H self propelled crane
- 1—Lorain 40 Dragline and Backhoe
- 1—80D Shovel only
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- 1—1 yd. Mixermobile
- 2—Cat. D2 High Lifts
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- 2—D8 Cats., 2U series with dozers
- 1—Caterpillar Model 10
- 1—D7 Cat. Tractor with dozer
- 1—Cletrac Model 38
- 1—New Angle Dozer for D6
- 1—New Straight Dozer for D4
- 2—Conveyors
- 1—K11 International Tractor 30 ton Low Boy
- 1—Concrete Mixer 7S
- 1—34E Paver
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- 1—60 cu. ft. compressor

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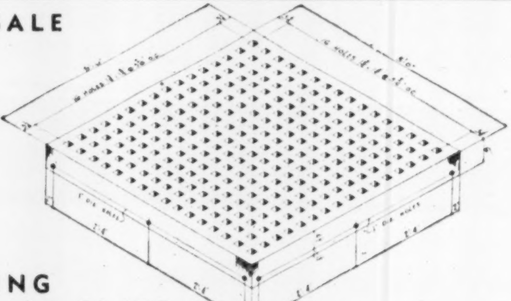

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- 1—160 cu. ft. Gardner-Denver Compressor, 4 steel wheels
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- 1—Barber-Greene 82A Bucket Loader, on crawlers
- 1—21E Rex Paver
- 4—Electric Centrifugal Pumps
- 3—Triplex Road Pumps
- 1—3/8 yd. Byers Bearcat, Jr. Shovel and Backhoe
- 1—Model D7 Caterpillar Angledozer
- 1—Model WSO Allis-Chalmers Tractor and 8 yd. Scoop
- 1—Model WK Allis Chalmers Angledozer
- 1—Model BG Cletrac Angledozer
- 1—8 cu. yd. Euclid Bottom Dump Wagon on crawlers

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SHOVELS, ELECTRIC: Bucyrus Erie 170-B, 6 yd. cap. and 120-B, 4 yd. capacity.

SHOVELS, DIESEL: Lima 1201, 3 yd.; Lima 802, 2 yd. Shovel & Crane; Northwest 80-D Crane.

BIRD CENTRIFUGE: Solid bowl type, continuous, capacity 30 tons per hour, 30% to 60% solids, with 100 H.P. motor. NEW Condition.

CARS: 20 Western and Koppel, 20 yd., all steel, air dump, cast steel trucks, rebuilt.

TRUCK CRANE: Bay City 20 ton, 80 ft. boom, on cranemobile 10 wheel truck.

DRAG SCRAPER OUTFITS: Sauerman 50 H.P., 75 H.P. and 150 H.P., complete with all accessories.

JAW CRUSHERS: Farrel 15-B, size 24 x 36, manganese fitted, with or without motor and drive. Pioneer 24 x 36 portable, with or without diesel power. Also, all sizes 4 x 6 to 48 x 60".

GYRATORY CRUSHERS—SPECIAL: Allis Chalmers Superior McCully 30", manganese fitted.

GYRATORY CRUSHERS: All sizes 8" x 30" to 42" x 134".

REDUCTION CRUSHERS: Symons 2 ft., 3 ft., 4 ft. and 5-½ ft. Telsmith 24" Gyrasphere. Good Roads 1040. Traylor 36" TY.

DRYERS & KILNS: Single Shell—40" x 38 ft., 48" x 46 ft., 60" x 35 ft., 70" x 42 ft., 90" x 60 ft., 96" x 125 ft., 120" x 90 ft. Double Shell—80" x 60 ft.

TRUCKS: 30 Euclid bottom dump, also, end dump, with rock bodies, Cummins 150 H.P. and 275 H.P. diesel motors, with booster steering, 15 ton and 22 ton capacity.

DRILLS: Bucyrus Erie 29T electric or gas with 9" bits.

PULVERIZER: B & W Coal Pulverizer size 32, capacity 7500 lbs. of coal per hour.

HARDINGE MILLS: 5' x 22", 8' x 20", 8' x 30".

DIESEL LOCOMOTIVE: Plymouth 25 ton, standard gauge, with caterpillar diesel motor.

MINE HOISTS:

- 1—Double drum 120" x 60", 1-¾" rope, 1000 H.P.
- 1—8' dia., 6'6" face, 600 FPM, 1000 H.P., 1-½" rope, 2200 volt, 450 RPM, single drum.
- 1—All steel, drum 8 ft. dia., 1-½" rope, 64,000 lbs. single line pull, 600 FPM, 400 H.P., 2200 volt, A.C., single drum.
- 1—250 H.P., single drum, 7'3" x 5', 30,000 lbs. single line pull, 750 FPM.
- 1—150 H.P., double drum, 38" dia., 42" face, 440 volt, A.C.

All the above Hoists complete with control equipment.

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INGERSOLL-RAND. Model 500, 2 stage Air compressor, WAUKESHA gas engine, clutch, electric starter, 4 solid rubber tires, New in 1939, good condition.

INGERSOLL RAND. Model 500, 2 stage Air compressor, WAUKESHA gas engine, clutch, electric starter, 4 pneumatic tires. Also Diesel conversion assembly. New in 1939. Reconditioned.

CMC. Model 7S, End Discharge concrete mixer, complete with skip no tank, powered by Hercules gas engine, mounted on pneumatic tired wheels. Mfg in 1940. In operating condition.

JAEGER. Model 6S, End Discharge Concrete mixer, Complete with tank, skip, powered by 4 cyl. Hercules gas engine, mounted on 2 pneumatic tired wheels, in excellent condition.

JAEGER. Model 10S, End Discharge Concrete mixer. Complete with water tank, power loader, low charging hopper, Hercules 4 cyl. gas engine. Mounted on 2 pneumatic tired wheels. Mfg in 1934. In operating condition.

REX Model 6S, End Discharge, concrete mixer. Complete with power loader, water tank, 4 cyl. Wisconsin air-cooled gas engine. Mounted on 2 pneumatic tired wheels. New in 1947. In excellent condition.

REX. Model 6 PLASTER MIXER, powered by 4 H.P. single cylinder air-cooled gas engine. 2 pneumatic tired wheels. Mfg. in 1946. In good condition.

REX. Model 16S End Discharge, concrete mixer. Complete with power loader, water tank, 4 cyl. Wisconsin air-cooled gas engine. Mounted on 4 pneumatic tired wheels. New in 1948. In excellent condition.

BUCYRUS-ERIE. Model 22B, ⅝ yard, truck crane, mounted on STERLING 10 wheel carrier, 30' boom, crane and clamshell equipment, but no bucket. BUDA gas engine on crane, WAUKESHA engine on carrier. Mfg. in 1949. In excellent condition.

LORAIN. Model 40 CRANE, 30' boom powered by 6 cyl. WAUKESHA model ML gas engine. Mounted on 10 wheel MACK TRUCK. Made in 1937. In good condition.

LORAIN. Model L-40 CRANE, 50' boom, lifting crane attachment, less hook. Gasoline engine. Mounted on A.C. MACK 6x6 Tandem drive. Mfg. in 1941. In good condition.

LORAIN. Model TL-20 CRAWLER, powered by WAUKESHA gas engine, 30' boom, clamshell equipment and lifting crane equipment. Made in 1948. In excellent condition.

P & H Model 600, 1¼ yard CRAWLER Shovel powered by gas engine. Mfg. in 1932. In operating condition.

UNIT MODEL 514, ½ yard CRANE, 25' boom, RUD-O-MATIC tagline, crawlers, Chrysler gas engine with starter. New in 1947. In good condition.

McKIERNAN-TERRY Model 1 PILE HAMMER. In good condition.

AURORA. 2 stage Self Priming JET PUMP, 300 G.P.M. 125#, 4" suction, 3" Discharge, 35 HP BUDA ENGINE, 4 steel wheels. New in 1940. Good condition.

JAEGER. Model 3P Self-Priming CENTRIFUGAL PUMP, 3" SUCTION, 6 H.P. Wisconsin, air-cooled engine, 2 steel wheels. New in 1939. In good condition.

JAEGER. Model 10P Self Priming CENTRIFUGAL PUMP, 10" SUCTION, 65 H.P. Hercules, 6 cyl. engine. 4 steel wheels. New in 1939. In good condition.

STERLING. Self-Priming CENTRIFUGAL PUMP, 8" suction, 50 HP WAUKESHA. 6 cyl. gas engine, 4 steel wheels. In good condition.

ALLIS-CHALMERS. Model HD-7 TRACTOR, 63" tread, canopy, starter, Gar Wood hydraulic bulldozer, Mfg. in 1947. In good condition.

ALLIS-CHALMERS. Model HD-7 TRACTOR, with Gar Wood hydraulic bulldozer, starter, 18" shoes. New in 1947. In operating condition.

ALLIS-CHALMERS. Model HD-5 Tractor Shovel, Hydraulically operated bucket, starter, cab, 13" shoes. In good condition.

ALLIS-CHALMERS. Model WF Wheel Tractor with Le Roi gas engine, hydraulic operated blade, rear tires 11.25x24, front tires 5.50x16. In operating condition.

BUCYRUS-ERIE. Model TD-9 DOZER SHOVEL. Mfg. in 1946. In very good condition. Extra blade.

BUCYRUS-ERIE. Model TD-9 DOZER SHOVEL. Backfiller blade, skeleton cab. New in 1947. In fair condition.

BUCYRUS-ERIE. Model TD-9 DOZER SHOVEL. New in 1946. In very good condition.

CASE Model DI TRACTOR, electric starter, and lights, Hough ⅝ yard bucket. Late model but without bucket control. Also backfiller blade and crane hook.

CASE Model VAI Wheel with hydraulically operated blade, starter. In good condition.

CASE. Model VA Wheel Tractor with hydraulically operated blade, rear tires 10x24 front tires 5.50x15. In operating condition.

CATERPILLAR. Model R-2, with La Plant Choate hydraulic bulldozer. Made in 1940. In operating condition.

CATERPILLAR. Model R-4 gasoline Crawler TRACTOR with Hyster winch and Le Tourneau cable bulldozer. Made in 1943. In operating condition.

CLETRAC. Model HG-31 gasoline Crawler Tractor with electric starter, lights and Anderson bulldozer. New in 1949. In excellent condition.

CLETRAC. Model HG-42 and hydraulic lift snow plow, Gar Wood rear cable winch. In good condition.

CLETRAC. Model DD Crawler Tractor with HEIL hydraulic bulldozer. New in 1946. In good condition.

CLETRAC. Model DG, 15" shoes, 48" tread, electric starter, crank case guard, with HEIL hydraulic bulldozer. New in 1945. In operating condition.

INTERNATIONAL-HARVESTER. Model I-4, heavy duty front axle with spring, electric starter, muffler, 1 set rear wheel weights. Tires 6.00x20, 8 ply front, 12.00x24—6 ply rear. Trojan bulldozer. New in 1948. In good condition.

INTERNATIONAL HARVESTER. Model I-14 Wheel TRACTOR with hydraulically operated blade, rear tires 13.00x24, front tires 6.00x16, rear wheel weights. In operating condition.

INTERNATIONAL-HARVESTER. Model TD-6, 50" tread, standard attachments and B-E hydraulic bulldozer. New in 1946. In fair condition.

INTERNATIONAL-HARVESTER. Model TD-6, 50" tread, 16" track shoes, standard attachments, B-E hydraulic bulldozer, 1948 Model, in good condition.

INTERNATIONAL-HARVESTER. Model TD-6, 50" tread, 16" shoes, standard attachments and B-E hydraulic bulldozer. Mfg. in 1947. In good condition.

INTERNATIONAL-HARVESTER. Model TD-9 Diesel Crawler Tractor, 60" gauge, 16" shoes with standard attachments and B-E hydraulic bulldozer. Mfg. in 1947. In very good condition.

INTERNATIONAL-HARVESTER. Model TD-9, 44" tread and B-E hydraulic bulldozer. Mfg. in 1940. In good condition.

INTERNATIONAL-HARVESTER. Model TD-14, 56" tread, with Isaacson hydraulic bulldozer. Mfg. in 1946. In good condition.

INTERNATIONAL-HARVESTER. Model TD-14, 74" tread, standard operating attachments, B-E hydraulic bulldozer. New Track shoes. Mfg. in 1945. In very good condition.

INTERNATIONAL-HARVESTER. Model TD-14, 74" tread, 18" shoes, B-E hydraulic bulldozer, rear power take off, hood side doors, electric starter. Engine has new block. New in 1939. In operating condition.

INTERNATIONAL-HARVESTER. Model TD-18, 74" tread, with electric starter and lights, standard equipment and Isaacson hydraulic bulldozer. New in 1947. In good condition.

INTERNATIONAL-HARVESTER. Model TD-18, 74" tread, 20" shoes, B-E hydraulic bulldozer. New in 1947. In good condition.

PUMPCRETE. DOUBLE, Model 180, powered by WAUKESHA, 6 cyl. engine with remixer powered by Le Roi gas engine. Few fittings, no pipe. On skids. Made in 1939. In good condition.

BELL PRIME MOVER, with dump bucket, bucket splash guards, knuckle guards. Made in 1948. In excellent condition.

HOUGH. Model TD Bulldozer Blade. Slightly used.

HOUGH. Model HLD Payloader, Hydraulic bucket control and backfiller blade. New in 1948. In excellent condition.

HOUGH. Model HLD Payloader with gravity dump bucket. New in 1946. In operating condition.

SHOVEL front, chain drive, for LORAIN 40. In fair condition.

TROJAN PATROL GRADER with cab blade, scarifier, bulldozer and leaning front wheels. New in 1948. In excellent condition.

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NORTHWEST. Model No. 5, gasoline engine, 45' crane boom, fairleads, on crawlers. In operating condition.

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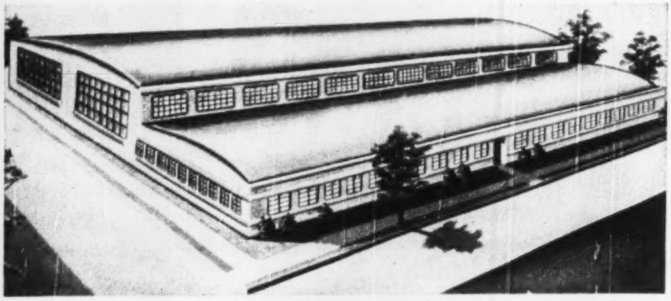

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PATROL GRADER Adams, Model 302, serial #258, w International 130 engine. An excellent value ready to go. FOB Paducah, Ky $1,595.00

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COMPRESSOR Ingersoll Rand, 315 cu. ft. Streamlined model mounted on four steel wheels. FOB Louisville $1,675.00

TRACTOR-DOZER International TD14, No. TBFM2100, with Isaacson DAS14F hydraulic angledozer. Good condition. FOB Louisville $3,650.00

P & H DRAGLINE, 3 yd., Model 955 LC, Long "Cats"; Atlas Diesel engine, 80 ft. boom, 3 yd. Page bucket, 1500 watt Kohler light plant. New in 1940. Actual value, $38,000. Our price $19,500.00

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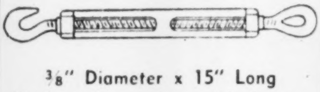

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12½ ton capacity, 10 tires, latest design, 627 miles on speedometer. Machine serial #8455. Price—$10,500.00 Milwaukee.

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New #36-9300 Simplex Double Leverage Pipe Push & Pull Jacks with ¾" to 4" Jaws & Pilots.

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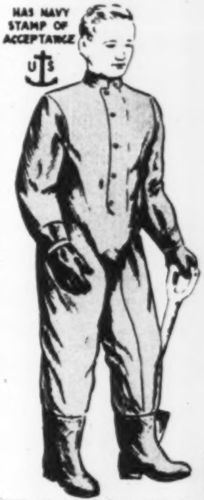
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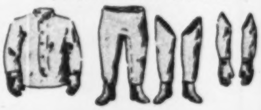

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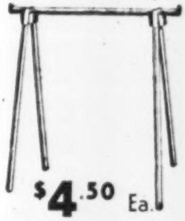

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#10 Bulldozer Attachment for Model 412 Adams Grader
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Concrete Paver, 27-E Multifoote #4230, Lane #47
Concrete Pavement Road Forms—
  Blaw-Knox
  2090 ft. 9" x 6"
  1380 ft. 7" x 6"
  2960 ft. 7" x 8"
Crusher, Climax Model 2½, Serial #2509, 10" x 20" (Manganese Jaw & Cheek Plates) Lane #10
  Acme Model 11D #2128, size 14" x 26" Lane 30
  Acme Tailings 6" x 20", Ser. #2137, Lane 31
  Acme Solid Frame 18" x 32", Ser. #1956, Lane #19
  Cedar Rapids 18" x 36" Roller Bearing Jaw Crusher, Serial #5676, new shaft and bearings
Drill Sharpener—for solid steel Ingersoll-Rand Type 40 #8266
Form Tamper, Cleveland #062 x 44, with pneumatic-tired wheel—B&S Motor Model A
Grinder, Jackbit—Ingersoll-Rand 330 J2 with pump and attachments
  Ingersoll-Rand Size J-5 #A1385, with pump
Motor, Waukesha #1JLL 80 H.P. Industrial Unit Gas Driven, Unit #2990, Motor #194819
Pile Hammer, Union Model A, Size 1½", Serial #2036
Pipe (water)—
  Approx. 2540 ft. 2½"
  " 21240 ft. 2"
  " 2500 ft. 2" (galvanized)
Pushdozer, #PGU-2004, for RD8 Caterpillar Tractor
Linn Tractor (Half-Track) Model D33, Maker's No. 2034 —Good Steel Dump Body
Linn Tractor (Half-Track) Model D33, Maker's No. 2040—Good Steel Dump Body
G.M.C. Truck, Model T85C Chassis #85-127 with Asphalt Distributor
6 Ea. Truck Bodies—Dump—2½ C.Y. with hoists and power take-off and cab protectors

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37 Colony Street
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G. M. DIESEL

MODEL 6-278A

Extremely Attractive Buy

General Motors Marine Diesel, 6 cyl., 2 cycle, 600 shaft horsepower, complete with General Electric D.C. generator, 300 kw. Full accessories. Eight boxes brand new spare parts. Exhaust muffler.

This engine and generator virtually new. Used only a few hours on Navy Training School test stand. In superb condition. Attractively priced for immediate sale.

Write or wire for complete descriptive material.

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Lorain Model L820 Standard Shovel #15135
Marion Model 362 Drag or Shovel
Manitowac Model 3500 Hi Front
Lima Model 1201 Hi Front or Standard
P & H Model 1055 Drag or Hi Front
Osgood Model 200 Back Hoe
Osgood Model 200 Crane

GRADERS

Motor Patrol Caterpillar Model 12 Serial 9K8282
Warco Diesel Tandem Serial VD145120
Allis Chalmers small, serial 1E42

TRENCHERS

Cleveland Model 95, 110, 140
Buckeye Model 410, C 15, C 10, C 224
Parsons Model 310 Diesel like new
P & H Model 10-30
Austin Model 105,600
Barber-Greene Model 44C

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Galion 2 wheel 10 ton Serial 1567
Lewis 2 wheel Tandem, 2½-3 ton

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Lakebelt LS40
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Northwest Model 6, 25, 800
Osgood Model 200, ½ yard
Lima 1201 Standard Front or Hi Front

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(20) D8 in 8 R series dozers
(10) D8 in 2U series dozers
(10) HD19 Allis Chalmers dozers
(5) D7 in 3T series dozers
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Owens ½ yd., ⅝ yd., ¾ yd.
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These are demonstrators you should see in our yard or write for catalog.

Front End Loader 2,000# complete with 2/3 yd. Scoop, Forks, Concrete Hopper, Concrete Bucket, Pneumatic Tired, Hydraulic Control. **Price** **$3,500**

Front End Loader 10,000# complete with 60 Cu. Ft. Scoop, Loader Boom, Forks, Pneumatic Tires, Single Rear Wheel Steering, Hydraulic Controls. **Price**.... **$5,500**

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2000-B Manitowoc 1¼ yard machine, excellent condition, 50' boom, $11,500.00, f.o.b. New York City.

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Model 307 General Truck Crane, 18 ton capacity, mounted on 10 wheel 6 cylinder BQ Mack, air brakes, 90' main boom, excellent condition, $9,000.00, f.o.b. New York City.

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2 Drum Diesel Hoisting Engine and Swinger, new, in crates, 75 h.p. 7,500 line pull, $2,500.00, f.o.b. New York City.

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Shovels: 38B Bucyrus, 1201 Lima, 80 Lorain, 75B Lorain (2), 10B Bucyrus Shovels & Backhoes (2), 40a-Marion Drag & Shovel

Shovel front for 2000 Manitowac

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Air Compressor, 105 to 500 ft., Diesel

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In good condition.
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Northwest Model 6 CRANE and CLAMSHELL COMBINATION, 80' boom, good working condition.
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Lorain-L820-New-2 Yard

combination shovel and dragline. This machine has never been used. Can be bought at a great saving.

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6 EUCLID 9 FDT Bottom Dump haulers, Cummins 150 h.p. diesel engines. Price each $12,750.00

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Model 180 Single Pumpcrete
1000' of pipe and fittings
For Quick Sale—$5500.00

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72' Steel Box Type Boom—2 cu. yd.—25 ton lifting capacity. Equipped with Ingersoll-Rand Diesel Air Compressor to operate Steam Hammer and Diving Equipment. Has Diesel Generating Set and Auxiliary. Hull built for Government in 1943. Size 105'6" long x 32'3" beam x 10'6" depth. Fairbanks Morse Diesel Engine recently rebuilt. Complete with Fuel. Water and Air Tanks.

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$1.50
Each
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COMP. WITH NEW 15" DETACHABLE FLEXIBLE SPOUT

A rugged can for fuel and oil storage for field equipment. Can is used but in good condition. Spout is new with breather rod and breather tube.

12 Cans	$ 15.00
48 Cans	$ 54.00
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PLATT CENTRIFUGAL PUMP
15½" Impeller—1000 GPM against 125# pressure—Excellent condition.

USED STRUCTURAL STEEL
24"—Beams—6" Flange—21 ft. long
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Canvas Belting—Hi-Pressure hose
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5—Vulcan 36" gauge steam locomotives
41—5 cu. yd. Western 36" gauge dump cars
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2—Redier cement conveyors
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1—8" sand pump
12—1 cu. yd. Steubner bottom dump concrete buckets
20—2 cu. yd. Steubner concrete buckets
1—¾ yard Erie steam shovel
1—1750 CFM Ingersoll Rand air compressor, with 300 electric motor
2—Whitcomb battery locomotives, 36" gauge, 10 and 12 ton
One lot electric motors, etc.
1—Marion Model 37 steam shovel, 1 ¾ yard bucket
Rail, pipe, concrete vibrators, grout mixers, wagon drills, 50 ft. crane boom, Cameron pumps, concrete carts, etc.

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PAVING EQUIPMENT
EXCAVATING EQUIPMENT

Forms, Bins, Finishers, Spreaders, Pavers, etc., etc. Tournapulls - Scrapers - Tournadozers, etc.

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FOR RENT:
Lorain #75B and Byers #104 shovel-cranes

Both are one cubic yard machines and are in good operating condition.

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Prices range from $400.00-$750.00

One 1948 FORD—Completely equipped—extra clean $2250.

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For Sale or Trade

for your present earthmoving equipment. 1—34E Koehring paver, 1—Heltzel cement bin 400 bbl., 2—Blaw-Knox aggregate bins, 100 ton, 1—Jaeger spreader 10' 11' 12', 1—Jaeger finishing machine Type H 11'-12', 1—Koehring bullfloat 10'-14', 1—R-B subgrader 11'-12', 7,000 ft. Blaw-Knox forms 9"x9". For details write

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1—Used Model T6K Michigan Truck Shovel complete with drivers cab and outriggers. The machine is in A-1 condition and was new July, 1948.

Price $7,500

This machine as a combination shovel and crane.

Price $8,000

This machine as a combination shovel, crane and backhoe.

Price $8,500

It is available for immediate delivery.

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CREDLE-NOLAN EQUIPMENT, INC.

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Phone: 4-1124

1949 P&H 150 Truck Crane, w 60' boom, 20' jib, gasoline powered for steel erection.

1946 P&H 150 Truck Crane, w 60' boom, 20' jib, gasoline powered for steel erection.

⅜ yd. Quick-Way Crane w Bucket & Dragline, mounted on 4x4 Coleman.

1948 Gradall, complete with 24" and 36" Buckets, and 8' Blade.

1947 B-G-H Cletrac, gasoline powered w Sargent overhead shovel.

10 ton 3 wheel Huber Roller.

1950 BARGAINS IN GOOD EQUIPMENT

1—1947 Mod 512 Adams Motor Grader with Diesel Engine, with Giant Vee Snow Plow and Wing, Scarifier, Closed in Cab, Heater, Elect Lights, Rebuilt and guaranteed .... **Price $7,500.00.**

1—1945 TD 14 International Tractor complete with Bucyrus-Erie Angle Dozer. Rebuilt—like new. **Price $6,000.00.**

1—1948 Mod E Quick-Way Shovel with Diesel Motor mounted on Mack Chassis, used less than 1000 hours, equip with Back Hoe Attach. Excellent cond.—30 Day Guarantee. **Price $7,000.00.** Shovel Attach available also for same, if needed, at extra cost.

1—Rebuilt FWD Four Wh Dr Truck with Dump Body and Power Hyd Front Mtd Push Frame, comp with new Waukesha Motor and Snow Plow. Excellent buy. Truck normally sells for $5,650.00 .... **Price $1,850.00.**

1—1947 Mod HR FWD Four Wh Dr Truck comp with Wausau 10 ft. Reversible Plow and ft mtd frame, 3 yd dump body.......... **Price $2,500.00.**

1—1946 Q 10 Crawler Mtd Nelson Snow Loader equip with self-starter, LeRoi Motor, elect. lights, practically new. For quick sale **Price $2,750.00.**

2—1941 Auto-Car Four Wh Dr Trucks comp with Ross Vees and Wings. Good rubber. Excellent cond .... **Price $3,250.00 each.**

1—Cat 10 Tractor comp with rubber tracks and Reversible Snow Plow with hyd lift. Reconditioned where needed—new leather cushions—cleaned and repainted. Excellent cond. **Price $850.00**

1—1946 Austin-Western Patrol Sweeper. Rebuilt, in excellent cond. Comp with extra rear broom and gutter broom. .... **Price $2,650.00.**

1—1949 Mod 41 Hanson ½ Yd Shovel, used approx 1200 hrs. Like new. With Shovel Attach—FOB Conn. .... **Price $7,500.00.**

1—Warco Grader Tandem Dr, hand control, excellent rubber and motor. Real buy. Will paint to suit. .... **Price $650.00**

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Scoopmobiles & Buggymobiles

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2 EUCLID REAR DUMP TRUCKS *NEW 1947*

MODEL—53 FD with 9-yard end dump bodies. Serial Nos. 6417 and 6416.

POWER—6-cylinder G. M. Diesels. Serial Nos. 671165463 and 671165461.

TIRES—Front 12.00 x 20—16 ply. Rear 14.00 x 20—20 ply.

EQUIPMENT includes 15-inch Hydrotarders, spare wheels, tires. Both units in excellent condition, used less than 2000 hours each. Motors completely overhauled by General Motors dealer, August, 1949.

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3—Euclid Dump Trucks
1949 Model 27FD End Dump.
9.7 Cu. Yd. Struck.
Pay Load 30000#.

1—Towermobile with 45' Tower.
1941 Ford V8 Motor.

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CONSTRUCTION COMPANY
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ALL LATE MODELS

- 1—Allis Chalmers Tractor
- 1—Caterpillar Auto Patrol
- 5—D W 10's—3000 hrs. or less
- 1—Caterpillar D8 Angledozer
- 1—Caterpillar D7 Bulldozer

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Double Drum Skagit Gaso. Hoist, Model BU-140
Capacity 49000# @ 57 F.P.M.
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CULVERTS
For every structural and operational purpose
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REINFORCING BARS & FABRIC
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SPECIAL OFFERING
We Offer
50,000 Good Used Creosoted Cross Ties
Immediate shipment

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1—G. & H. 6000 gal. per minute pump. 18" discharge, 14' lift, less than year old, powered by General Motors 371 full diesel power unit	$2200.00
1—Caterpillar Model 22 Tractor	$750.00
1—Insley K-12 Crane w/wide tracks, Buda gas power, 2 yrs. old	$6000.00
1—½ yd. Hendrix drag bucket	$250.00

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Phone—Kingswood 7829

Union Grout Mixer & Ejector, 7 cu. ft.

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WROUGHT Steel Pipe

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VALVES
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VALVES and FITTINGS
All Sizes in Stock
NEW-USED
GREENPOINT IRON & PIPE CO. INC
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B & S PIPE FITTINGS
All Sizes
STEEL PIPE and VALVES
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FOR SALE

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1—1947 Cab. O.E. Ford 4 yd. body Dump Truck	1000.00
1—1930 Speeder Shovel & Back Hoe	2500.00

Office Wyckoff 4-0396 Res. Wyckoff 4-0088

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USED TRACTOR PARTS

For Caterpillar, International, and Allis-Chalmers Tractors. Also, Dragline Parts and GMC Diesel Engine Parts.

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GAS LOCOMOTIVE CRANE

25 ton cap. Orton gas locomotive crane, serial 43115, built 1927, powered with 6 cylinder Climax gas engine. Boom is 50'. Attractive price FOB Chicago.

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Other lengths & sections at various locations

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"WE BUY STEEL PILING FOR CASH"

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500 PCS. BETH. DP2—70—60—30—20 Ft.
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500 PCS. BETH. DP1—27, 30 & 45 Ft.
2000 PCS. BETH. SP4—40'/60'.
8 VULCAN No. 1 & 2 HAMMERS
E2 McK-T & 800A VULCAN EXTRACTORS
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FOR SALE:

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FS-2461, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

Surveying Instrument Advertising—page 360

FOR SALE

ONE JAQUES EARTH BORING MACHINE

Model HM with Turntable mounted on GMC 6'x6' all wheel drive. Truck also equipped with 15,000 lb. Tulsa Winch and Headache Rack as well as special steel body built for this machine. Equipment purchased new September 1948, used 4 months. Excellent condition.

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FOR SALE

MARINE EQUIPMENT

	Location	Price
1—1100 c.y. Dump Scow	Cleveland	$10,000
1— 800 c.y. Dump Scow	Cleveland	8,000
1—1100 c.y. Dump Scow	New York	2,000
1—8 yd. Clamshell Dredge	New York	7,000
1—100 H.P. Launch	New York	1,000

FS-2416, Engineering News-Record
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5—Super-C Turnapulls with L. P. Scrapers, 15 cu. yd.

2—Super-C Turnapulls with 210AW Tournatrailers

1—210AW Tournatrailer unit only

Location — Pennsylvania. Generally good condition. Entire lot offered at very attractive figure.

FS-6016, Engineering News-Record
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Cold saw—capacity 16" I beams
Bridge cranes, 10 ton—Whiting
Large lathes

ARNOLD HUGHES CO.
765 Penobscot Bldg. Detroit 26, Mich.
WO-1-1894

2—TS300 La-Plante Choate Moto Scrapers, Serial #63 and #64. Used 8 months. Excellent condition.

Price....................$35,000.00 for both
f.o.b.............Karthaus, Pennsylvania

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10 TON GANTRY CRANE 50' SPAN, 3 AC MOTORS CAB CONTROL.

N. B. PAYNE & CO., Inc.
105 W. 55 St. New York 19
Tel. Circle 7-6730

NEW "SEARCHLIGHT" ADVERTISEMENTS received by March 27th will appear in April 6th issue, subject to space limitations.

Classified Advertising Division
ENGINEERING NEWS-RECORD
330 W. 42nd St., New York 18, N. Y.

AVAILABLE

SUBJECT TO PRIOR SALE

- Lima 1201 Dragline Cummins Diesel 80' Boom
- Marion 39A Dragline Waukesha Hesselman-Diesel 80' Boom
- Lima 802 Dragline Buda Diesel 65' Boom
- Insley K-14 Dragline-Clamshell Chrysler Gas 40' Boom
- AC Bulldozer HD-7 with Gar Wood Blade
- TD-14 International with B.E. Blade
- D-8 Caterpillar with LeTourneau bulldozer
- AC HD-10 with Baker Bulldozer
- Adams Graders Models 412, 201 and 102
- 20 Ton Per Hr. Asphalt Plant with Dryer

ALL PRICED TO SELL

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FOR SALE OR RENT

Lowest Prices

Cranes, Diesel:

1—P. & H., 750, 2½ Yd. Dragline, Fairbanks Morse 44HD, slightly used
1—P. & H., 655A, 1½ Yd. Dragline, unused
1—P. & H., 255A, ¾ Yd., Gasoline, unused
1—NORTHWEST, 80D, 2½ Yd., Barge-Mounted, unused
1—NORTHWEST, 6, 1½ Yd. Shovel, used, rebuilt, w/new Murphy Diesel
1—NORTHWEST 25, ¾ Yd. Shovel, 500 hours.
2—LINK BELT SPEEDER, K370, 1¼ Yd., unused & used
1—BUCKEYE, 70, ¾ Yd. Combination, gas., 150 hours

Miscellaneous:

2—Cat. Tractor Pipe-Layer, w/Hyster 30 ft. Top Boom, 2000 hours, Now overhauled, Ser. 7M4610 & 7499
2—QUICKWAY Truck Cranes, Mod. E, w/l Accessory Trailer, new Shovel, Dragline, Clamshell, Pile Driver
1—Compressor, 315 CFM, Chicago Pneumatic Mobile, Completely overhauled
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FS-2417, Engineering News-Record
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W-6051, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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POSITIONS VACANT

(Continued from page 340)

WANTED: MECHANICAL Engineer, age 35 to 45, should have had at least ten years experience in material handling, preferably in hoisting equipment field, also should have supervisary ability. Write full qualifications and salary requirements. P-2372, Engineering News-Record.

CIVIL ENGINEER experienced in field control of concrete and bituminous concrete, good opportunity, permanent. Write full qualifications. P-6007, Engineering News-Record.

SURVEYOR WITH established business is looking towards retirement. Looking for surveyor registered in state of Michigan who is a hard worker and can assume responsibility. P-6012, Engineering News-Record.

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GENERAL SUPERINTENDENT — 50 — A-1 executive always in top salary bracket. Former employers will say worth it. 22 years responsible charge major buildings and heavy construction. College graduate. Address PW-2493, Engineering News-Record.

CIVIL ENGINEER PROFESSOR PE & LS. Available June thru September 1950. Primarily interested in highway, building construction, office or field work. Location North Atlantic States. PW-2504, Engineering News-Record.

HIGHWAY ENGINEER, Seventeen years responsible experience in construction and maintenance including earthwork, rigid and flexible pavements, structures and sewers. Graduate civil engineer now employed as senior engineer by municipality. Desire responsible opportunity with consultant, contractor or public road authority. PW-2518, Engineering News-Record.

CONSTRUCTION SUPT. 51, married, 28 years supervising paving, bridges, dams, power plants, sewage disposal, water treatment plants and flood control projects. Midwest and Eastern contractors. Base salary $9000.00. PW-2366, Engineering News-Record.

GRADUATE CIVIL Engineer—Desire Position as field superintendent or asst.—3 years experience in building construction, estimating, cost work, purchasing, planning and coordination of subs. Location immaterial. PW-2373, Engineering News-Record.

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GRADUATE MECHANICAL Engineer, 34, registered, 11 yrs. engr. experience in heavy mfg., production planning, design, installation process, supervision and maintenance. Employed. Wants plant engr. job. Resume on request. R. W. Dallner, 511 N. Vine St., Marshfield, Wis. Phone 1329-R.

CIVIL ENGINEER—Harvard Graduate Business School, masters degree, June, 1950. Five years field and office contracting experience. Desires position in East requiring above background. 27, single. PW-6055, Engineering News-Record.

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PW-2393, Engineering News-Record
330 W. 42nd St., New York 18, N. Y.

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CONSTRUCTION ACCOUNTANT, 25 yrs. experience all phases building construction. General and cost accounting. Will relocate. PW-2424, Engineering News-Record.

MECHANICAL DESIGNER or Plant Engineer —8 yrs. chemical plant layout, process piping, machine design and maintenance, 7 yrs. diversified and supervisory experience. PW-6059, Engineering News-Record.

CONSTRUCTION-EXECUTIVE. Experience. Top executive positions in building construction and building management, in full charge; more than 18 years experience in offices of architects, contractors and engineers; extensive contact and sales experience. Graduate Architectural Engineer. PW-6034, Engineering News-Record.

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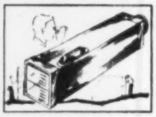

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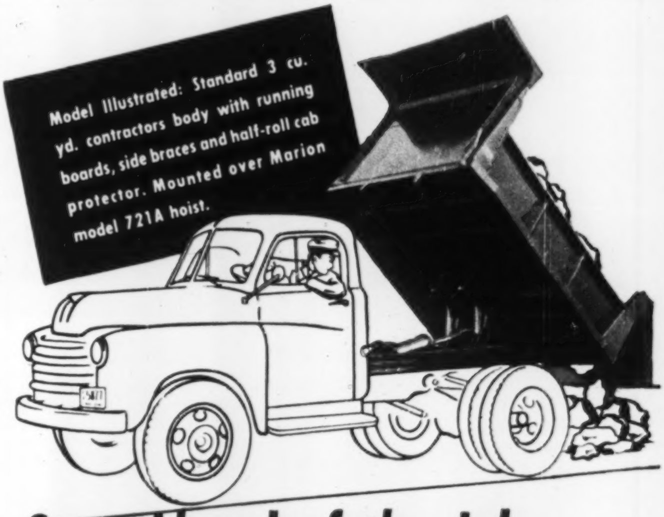

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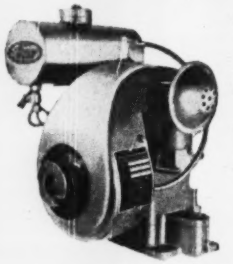

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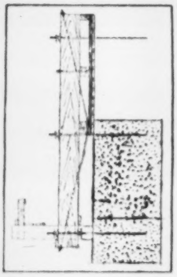

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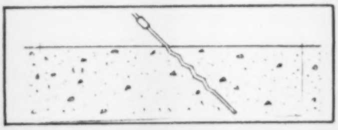

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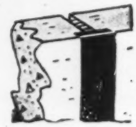

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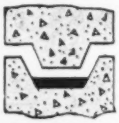

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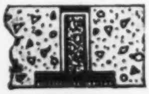

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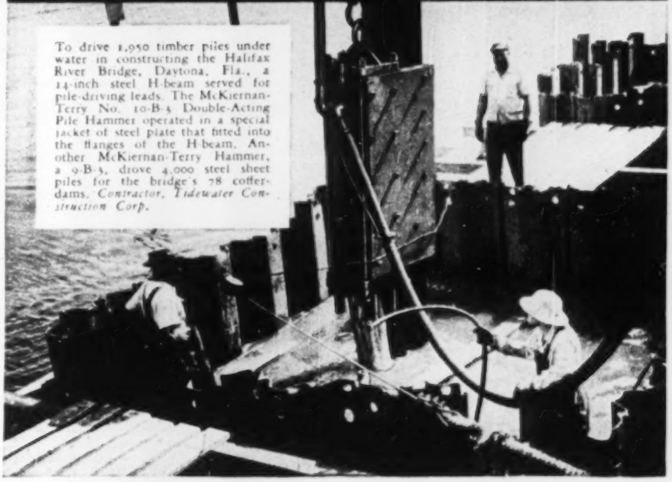

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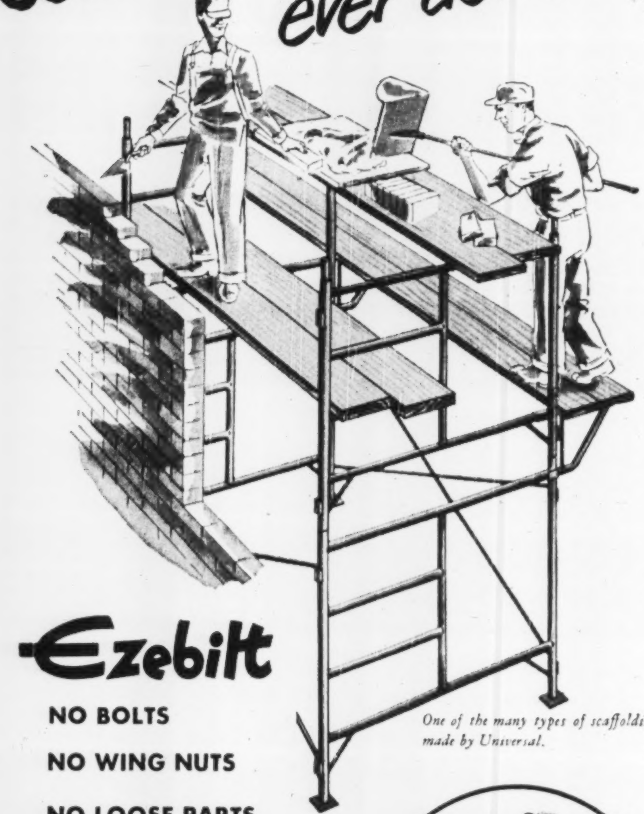

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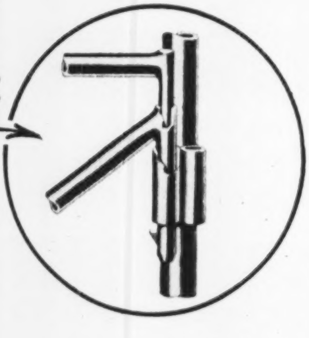

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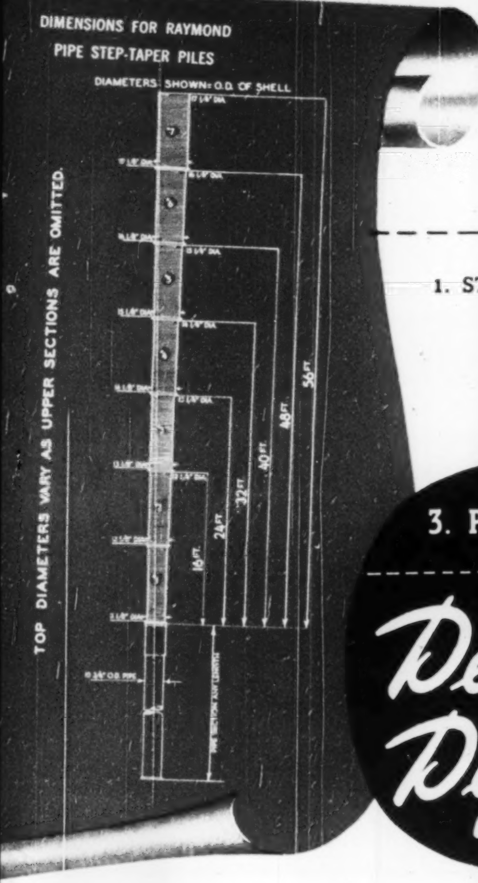
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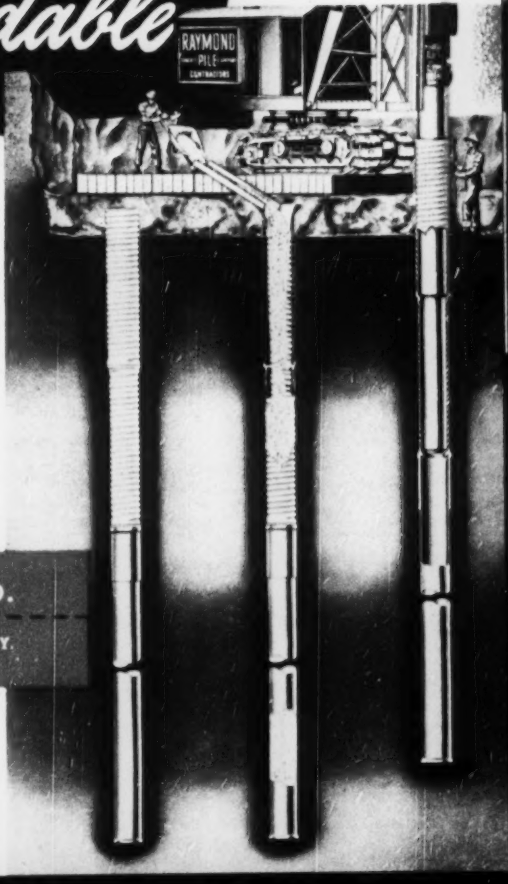
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